



RW 47

REVERSIBLE, MOUNTED, VARIABLE WORK
WIDTH PLOUGH

OPERATION AND MAINTENANCE MANUAL



GRÉGOIRE-BESSON S.A.

Rue Victor Grégoire
49 230 MONTFAUCON – MONTIGNÉ
FRANCE

Tél. : 33 (0) 2 41 64 72 67
Fax : 33 (0) 2 41 64 67 73

Web : www.gregoire-besson.com
Email : Contactfr@gregoirebesson.com

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CONTENT OF MANUAL

1. INTRODUCTION

- 1.1. ACKNOWLEDGEMENTS
- 1.2. CONDITIONS OF OPERATION
- 1.3. GRÉGOIRE BESSON WARRANTY
- 1.4. IDENTIFICATION OF MACHINE
- 1.5. IDENTIFICATION OF WEAR PARTS

2. SAFETY RULES

- 2.1. SAFETY OPERATION OF PLOUGH
- 2.2. VISUAL INSPECTION
- 2.3. KNOWLEDGE AND UNDERSTANDING OF SAFETY INSTRUCTIONS
- 2.4. SAFETY DECALS
- 2.5. FOLLOW THE SAFETY INSTRUCTIONS
- 2.6. BE PREPARED FOR CRITICAL SITUATIONS
- 2.7. DO NOT WEAR LOOSE CLOTHES
- 2.8. WEAR PROTECTIVE CLOTHES
- 2.9. BE CAREFUL AT STARTING IN ORDER TO AVOID DRIVING OVER
- 2.10. BE CAREFUL OF DANGER DURING HITCHING AND UNHITCHING OF PLOUGH
- 2.11. TAKE OFF THE IGNITION KEY
- 2.12. THE RISK OF TRACTOR OVERTURNING
- 2.13. PAY ATTENTION WHEN DRIVING ON PUBLIC ROADS
- 2.14. PAY ATTENTION TO ELECTRICAL WIRES
- 2.15. SIGNAL THE POSITION OF MACHINE
- 2.16. CHECK THE WHEELS
- 2.17. MANOEUVRE AND OPERATION ON FIELDS
- 2.18. NEVER CLIMB ON THE PLOUGH
- 2.19. NEVER MAKE ADJUSTMENT ON MOVING PLOUGH
- 2.20. PAY ATTENTION FOR CUTTING AND CRASHING
- 2.21. PAY ATTENTION FOR SWINGING
- 2.22. PAY ATTENTION TO PARTS UNDER PRESSURE (SECURITY, ETC...)
- 2.23. NO PASSENGERS ON THE TRACTOR
- 2.24. PAY ATTENTION TO FLUIDS AND GASES UNDER PRESSURE
- 2.25. PRECAUTIONS IN CASE OF PLOUGH WITH LARGE QUANTITY OF RESIDUE AND VEGETATION
- 2.26. PREPARATION AND ORGANIZATION OF MAINTENANCE
- 2.27. PREPARATION BEFORE STORAGE
- 2.28. REMINDER

3. DESCRIPTION OF PLOUGH

- 3.1. GENERAL CHARACTERISTICS
 - 3.1.1. DETERMINATION OF RIGHT AND LEFT SIDE OF PLOUGH
 - 3.1.2. IDENTIFICATION OF RIGHT AND LEFT WEARING PARTS
- 3.2. GENERAL VIEW
- 3.3. SPECIFICATIONS OF PLOUGH RW 47
- 3.4. DIMENSIONS AND WEIGHT OF PLOUGH RW 47
- 3.5. INFORMATIONS ABOUT GRÉGOIRE-BESSON EQUIPMENTS AND TECHNICAL PARAMETERS
- 3.6. THE PRINCIPLE OF REVERSIBLE PLOUGH
- 3.7. LES TÊTES DE RETOURNEMENT
- 3.8. POSITION OF BEAM

Operation manual of plough RW 47

- 3.9. WORKING WIDTH
- 3.10. TYPES OF SECURITY
 - 3.10.1 Light security « C »
 - 3.10.2. Screw security « B »
 - 3.10.3 Non-stop Naud mechanical security « N »
 - 3.10.4. Non-stop hhydraulic security « Y »
 - 3.10.4.1. The diameter of security cylinder
 - 3.10.4.2. Flow limiter
 - 3.10.4.3. Accumulators

4. PREPARATION OF THE TRACTOR FOR PULLING

- 4.1. NECESSARY TRACTION POWER
- 4.2. WHEEL TRACK OF TRACTOR
- 4.3. POSITION OF LATERAL STABILIZATORS
- 4.4. LIFTING RODS
- 4.5. LENGHT OF LIFTING RODS
- 4.6. LENGHT OG THIRD POINT
- 4.7. BALLASTING THE TRACTOR

5. ATTACHMENT AND DISENGAGEMENT OF PLOUGH

- 5.1. THE SAFETY ATTACHMENT AND DIENGAEMENT OF PLOUGH
- 5.2. THE ATTACHMENT OF PLOUGH TO THE TRACTOR
 - 5.2.1. In case if the tractor equipped with fixed ball lifting arms
 - 5.2.2. In case if tractor equipped with quick hitch couplings (quick attachment)
 - 5.2.3. Connecting the third point
 - 5.2.4. Adjusting the lenght of third point
 - 5.2.5. The position of supports
 - 5.2.6. Fixing of reverseor
- 5.3. DISENGAGING OF PLOUGH

6. HYDRAULIC CONNECTIONS

- 6.1. PAY ATTENTION ON YOUR SAFETY BEFORE WORKIN ON HYDRAULIC SYSTEM
- 6.2. PAY ATTENTION FOR FLUIDS UNDER PRESSURE
- 6.3. PRÉPARATION OF HYDRAULIC CONNECTIONS
- 6.4. NECESSARY HYDRAULIC POWER
- 6.5. CONNECTION OF FLEXIBILE HYDRAULIC HOSES
 - 6.5.1. Connect the flexible hoses logically
 - 6.5.2. Check the connections of flexible and rigid pipes
 - 6.5.3. Check the lenght of flexible hoses
 - 6.5.4. Examine the hydraulic connections of supplementary plough bottom
- 6.6. DEPORT HYDRAULIC ARM
 - 6.6.1. Principle
 - 6.6.2. Connection of deport hydraulic arm without automatic unit
 - 6.6.3. Connection of deport hydraulic arm with automatic unit
- 6.7. DEVERS HYDRAULIC ARM
 - 6.7.1. Principle
 - 6.7.2. Connection of devers hydraulic arm with automatic unit
- 6.8. LIFTING MEMORY FOR WORK WIDTH
 - 6.8.1. Principle
 - 6.8.2. Mounting of lifting memory

Operation manual of plough RW 47

7. PREPARATION OF THE PLOUGH BEFORE OPERATION

- 7.1. PRESSURE OF PLOUGH TYRES
- 7.2. CHECK THE FASTENING OF WHEEL BOLTS
- 7.3. ADJUSTMENT OF DEVERS ARM
 - 7.3.1. Principle
 - 7.3.2. Positioning the devers arm to plough
 - 7.3.3. Adjustment of mechanic and hydraulic devers arm
- 7.4. ADJUSTMENT OF MECHANICAL AND HYDRAULICAL DEPORT ARM
 - 7.4.1. Principle
 - 7.4.2. Adjustment of lenght the mechanic deport arm
 - 7.4.3. Adjustment of lenght the hydraulic deport arm
- 7.5. PREPARATION OF NEW MOULBOARDS TO OPERATION
- 7.6. LEARN THE NAMES OF THE PLOUGH SPARE PARTS
- 7.7. VIEW WHERE ARE THE PLOUGH ADJUSTING MECHANISM AND CHECK THEIR OPERATION
- 7.8. CHECK THE LAMPS AND THE SIGNALIZATION

8. TRANSPORT

- 8.1. BEFORE TRANSPORTATION
 - 8.1.1. Adjusting the plough to transport position
 - 8.1.2. Before transport the plough on public roads
 - 8.1.3. Locking/disengaging the rotation unit
 - 8.1.4. During transport put the center of gravity of plough low
- 8.2. DRIVING ON PUDLIC ROADS

9. ADJUSTMENTS ON THE FIELD

- 9.1. BE CAREFUL ON THE FIELD
- 9.2. ADJUSTMENT OF THE WORKING POSITION
- 9.3. CHOICE OF THE PLOUGH DIRECTION
- 9.4. ADJUSTING ON THE FIELD
- 9.5. THE FIRST COURSE
 - 9.5.1. PUTTING THE PLOUGH ON THE GROUND
 - 9.5.2. ADJUSTING THE DEVERS OF PLOUGH
 - 9.5.3. WORKING WIDTH
 - 9.5.4. ADJUSTMENT OF THE WORKING DEPTH
 - 9.5.4.1. Adjusting of the depth with the tractor lifting arms
 - 9.5.4.2. Adjustment of tractor control system (draft control)
 - 9.5.4.3. Adjusting the working depth on beating wheel
 - 9.5.4.3.1. Whel of field and transport RJL
 - 9.5.4.3.2. Furrow wheel RJR
 - 9.5.4.3.3. Lateral double wheel DRL 20
 - 9.5.5. ADJUSTMENT OF INCLINATION
 - 9.5.6. HYDRAULIC ADJUSTMENT OF FIRST FURROW (deport)
- 9.6. THE SECOND COURSE
 - 9.6.1. ADJUST THE DEVERS
 - 9.6.2. BALLANCE OF PLOUGH
 - 9.6.2.1. Adjust the position of third point
 - 9.6.2.2. Adjust the inclination (take level lateral = vertical)
 - 9.6.3. HIDRAULIC ADJUSTMENT OF FIRST FURROW WIDTH (déport)

Operation manual of plough RW 47

- 9.7. ADJUSTMENT OF « B » SCREW SECURITIES
- 9.8. ADJUSTMENT OF « S » MECHANICAL SECURITIES
- 9.9. ADJUSTMENT OF « N » NON-STOP MECHANICAL SECURITIES
- 9.10. ADJUSTMENT OF NON-STOP HYDRAULIC SECURITIES
 - 9.10.1. Securities base setting
 - 9.10.2. Increasing of the disengaging torque on plough blade end
 - 9.10.3. Decreasing of the disengaging torque on plough blade end
 - 9.10.4. The operation for modification of the disengaging torque of hydraulic non-stop security
 - 9.10.5. Adjustment when you alone on the field
- 9.11. ADJUSTMENT OF PENETRATION ANGLE OF PLOUGH BOTTOM (Entering)
- 9.12. ADJUSTMENT OF JOINTERS
 - 9.12.1. Security pins on the jointers
 - 9.12.2. Adjustment of the jointer height
 - 9.12.3. Front/rear adjustment of jointers

10. MOUNTING OF SUPPLEMENTARY PLOUGH BOTTOMS

- 10.1. SAFETY EQUIPMENTS
- 10.2. MOUNTING OF SUPPLEMENTARY PLOUGH BOTTOM TO REAR PART OF PLOUGH RW 47
- 10.3. HOW TO CONTROL THE SUITABLE WORKING AND FITTING OF HYDRAULIC SECURITY ON SUPPLEMENTARY PLOUGH BOTTOM
- 10.4. MOUNTING OF SUPPLEMENTARY PLOUGH BOTTOM TO FRONT PART OF PLOUGH RW 47

11. GREASING AND MAINTENANCE

- 11.1. PREPARATION AND ORGANIZATION OF MAINTENANCE
- 11.2. SAFETY INSTRUCTIONS FOR MAINTENANCE OF PLOUGH
 - 11.2.1. APPLY SAFETY PRACTICE
 - 11.2.2. BEFORE INSPECTION WASH THE MACHINE
 - 11.2.3. WORK IN WELL VENTILLATED PLACE
 - 11.2.4. WORK IN CLEAN PLACE
 - 11.2.5. USE SAFETY SUPPORTS
 - 11.2.6. DISCONNECT THE ACCUMULATOR
 - 11.2.7. PAY ATTENTION TO LIGHTING THE WORKING AREA
 - 11.2.8. USE PROPER TOOLS
 - 11.2.9. PAY ATTENTION FOR TIGHTENING OF BOLTS AND SCREWS
 - 11.2.10. TIGHTENING TORQUE OF BOLTS
 - 11.2.11. PAY ATTENTION TO ABRASIVE GRIT PIECES
 - 11.2.12. PAY ATTENTION TO GASES AND FLUIDS UNDER PRESSURE
 - 11.2.13. DO NOT PERFORM HEATING AND WELDING WORKS NEAR HYDRAULIC HOSES AND PIPES
 - 11.2.14. DO NOT OPEN THE HYDRAULIC ACCUMULATORS
 - 11.2.15. BEFORE HEATING CLEAN THE PAINTING
 - 11.2.16. PRECAUTIONS FOR MAINTENANCE OF TYRES
 - 11.2.17. PRECAUTIONS FOR REPARATION OF TYRES
 - 11.2.18. HANDLE WITH WASTE IN ECOLOGICAL MANNER
 - 11.2.19. REMINDER
- 11.3. FASTENING OF BOLTS
- 11.4. LUBRIFICATION / GREASING
- 11.5. MAINTENANCE OF PLOUGHS
- 11.6. THE PREPARATION OF PLOUGH FOR STORAGE PERIOD IN SHED
- 11.7. PRECAUTION FOR PLACING THE MACHINE TO SHED

Operation manual of plough RW 47

12. POSSIBLE SOLUTIONS OF EMERGING PROBLEMS

- 12.1. UNACCEPTABLE PENETRATION
- 12.2. IMPRECISE DEPTH
- 12.3. THE FIRST FURROW WIDTH IS NOT CONSTANT
- 12.4. IT IS DIFFICULT TO CONTROL THE POSITION OF LIFTING LEVER
- 12.5. THERE ARE HOLES IN THE FIRST FURROW
- 12.6. THE FIRST FURROW EXTREMELY GATHERS THE SOIL
- 12.7. THE TRACTOR IS SLIPPING
- 12.8. THE TRACTOR PULLS IN THE DIRECTION OF PLOUGH
- 12.9. THE FURROWS ARE NOT STRAIGHT
- 12.10.
- 12.11. THE SOIL ADHERES TO THE MOULDBOARDS
- 12.12. THE SOIL IS NOT TURNED PROPERLY AND FALLS BACK INTO THE FURROW
- 12.13. THE STUBBLE RESIDUE IS NOT TURNED INTO A SOIL PROPERLY
- 12.14. THE PINS OF SECURITY ARE ALWAYS SHARED
- 12.15. THE NON-STOP HYDRAULIC SECURITIES ARE DISCONNECTED
- 12.16. EXCESSIVE DISENGAGEMENT OF NON-STOP HYDRAULIC SECURITIES
- 12.17. NON-STOP HYDRAULIC SECURITIES DO NOT DISENGAGE
- 12.18. THE ACCUMULATORS DO NOT REACT TO BEATINGS
- 12.19. THE HYDRAULIC CONTROLS DO NOT OPERATE
- 12.20. THE TURNING UNIT DOES NOT WORK

13. RAPID ATTACHMENT OF THE PLOUGH

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1. INTRODUCTION

1.1. REMERCIEMENTS

The GRÉGOIRE-BESSON company thanks the owner of the new plough for choosing the GRÉGOIRE-BESSON brand and service.

1.2. CONDITIONS D'UTILISATION

The design and development of the plough has been performed under strict conditions. Nevertheless it is an agricultural machine which should be used accordingly. The usage should be performed on such fields where cultivation is performed accordingly to the agronomical rules. The GRÉGOIRE-BESSON machines under no conditions should be used for ground leveling, earthing, or as a ripper or for forest cultivating or uncultivated lands. Never use the machine for lifting people or materials. If you want to get the optimal result you should use and maintain the plough accordingly as it is shown in the Instruction.

The aim of this Instruction is to make the usage, adjustment and maintenance of the machine easier



For your security and safety before using any agricultural machine read its Instruction to the end or ask this machine operator to do it. Be sure that potential users have read the Instruction and have understood it.



Systematically check the machine, examine its adjustment and the fastening of the screws and pins.



Do not perform any changes of the machine or its additions (technical, electrical, hydraulic or pneumatic) without asking for written permission from the Grégoire Besson company.



Use the equipment accordingly. Take into consideration signals of danger and use protective equipment.



During the GRÉGOIRE-BESSON machine usage you should take into consideration the given country rules and laws about the prevention of accidents. You should follow the traffic and medical rules.



The security regulations in this Instruction are not restrictive.

It may be dangerous not follow these rules. The Grégoire Besson company is not responsible for any accident or damage.

Operation manual of plough RW 47

For further consultations keep this Instruction near by at you work place.

The Instruction should be counted as the element of the machine and as accessory at the selling.

The information in this Instruction is up-to-date nevertheless definite changes can be performed.
The GRÉGOIRE-BESSON COMPANY has all rights to change the machine appearance and characteristics without any advanced announcement or obligation even on already manufactured machines or machines being on sale.

1.3. GRÉGOIRE-BESSON GUARANTEE

The general conditions for GRÉGOIRE-BESSON confirmation and guarantee can be found at the dealer's.

The guarantee is the part of GRÉGOIRE-BESSON service program which is given to such a client who wants to use and maintain the equipment in the way which is shown in this Instruction.

The guarantee is not available for those who damage the equipment or perform such changes on the machine which are not agreeable with the definition of the manufacturer.

The guarantee is not available for those who do not use the spare parts produced by GRÉGOIRE-BESSON company.

1.4. IDENTIFICATION OF THE MACHINE

Write down into the rubrics the type/model of the machine, number of series and the date of the purchasing. (the table on the pulling equipment).

Use this number when you want to order spare parts from the dealer. The service will be more precise.

Date of purchase	:
Model	:
Number of series	:
Adresse / Phone of dealer	:

Do not take off the manufacturer table as well as CE signalization table fixed on the machine.



1.5. IDENTIFICATION OF WEARING PARTS

To make the order of the wearing parts easy it is recommended to put down the identification number of the spare parts of the plough:

DÉSIGNATION	RÉFÉRENCE Pièces Gauches Reference Left spare parts	RÉFÉRENCE Pièces Droites Reference Right spare parts	
Designation			
Turning chisel end			
Chisel end screw			
Screw +nut			(left & right)
Square chisel end			(left & right)
Coulter			
Coulter screw (screw + nut)			(left & right)
Plough end			
Plough end screw (screw + nut)			(left & right)
Moulboard			
Moulboard screw (screw + nut)			(left & right)
			(left & right)
Plough sole			(left & right)
Plough sole screw (screw + nut)			(left & right)
Plough sole supporter			(left & right)
Plough sole supporter screw			(left & right)
Jointer coulter			
Jointer coulter screw (screw + nut)			(left & right)
Jointer moulboard			
Jointer moulboard screw			(left & right)
Security pins of the elements			(left & right)
Security pin of the coulter			(left & right)
Other			
Other			
Other			
Other			
Other			
Other			
Other			
Other			
Other			

2. General safety

2.1. Prudence of plough usage

During the usage and maintenance of the plough we should be always careful. We should follow every safety rules described in the instruction.

Before the usage the operator should know how to operate the machine. The tractor driving can be performed only by a qualified person who knows the Traffic Rules as he has to drive on the public roads.

We should be sure, calm and moderate. It is not necessary to use the total engine power at the end of the field, on the roads or in the traffic (while going across a village).

We should be careful and pay attention to other vehicles or pedestrians. Before starting the machine be sure that there is nobody near it.

If there are children you should be especially attentive.

If any part of the instruction is not clear enough or should be explained, turn to our GRÉGOIRE-BESSON local dealer.

THE PRUDENT MACHINE-OPERATOR IS THE BEST GUARANTEE AGAINST ACCIDENTS.

2.2. VISUAL INSPECTION

Check the plough attachments before the usage to be sure that there are not any loose bolts or abraded spare part or damaged welding. Perform the necessary reparations or turn to the local dealer or service. After the maintenance make it sure that everything is in the perfect order, that every spare part or implement is on its place. During the designing or developing of a new machine the most important thing is the safety of the user. The designers built into the machine different safety systems. But you users and owners are responsible for the rules observing.

2.3. THE SIGNS FOR COMPREHENSION OF THE INFORMATION

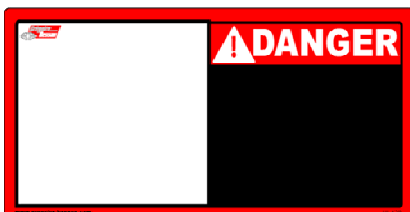


This symbol means alertness.

Be alert, if you see this symbol on the machine or in the instruction, because there can be danger for your life or you can be injured or the machine can be damaged. Make all the necessary precautions and be prudent.

Be especially careful if on the machine or in the instruction you find such warnings. **DANGER, AVERTISSEMENT / WARNING, ATTENTION / CAUTION.**

These signs mean different degrees of danger and usually placed the unsafe places of risks.

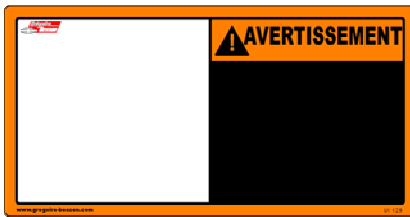


DANGER: means the most dangerous places.

The sign DANGER directly shows the place of risk.

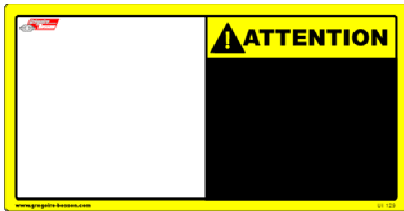
If you do not change the situation immediately it may cause serious injury or even death.

Operation manual of plough RW 47



ALERT/ WARNING : means potential danger. If we do not follow the warnings, such situation can lead to a serious injury or even deathtrap. These warnings show the risks during the removing of the protective equipment or blocking elements. We can see the same warning signs if the utilization is not correct or dangerous.

The DANGER or AVERTISSEMENT signs are placed near places of danger or risks.



ATTENTION / CAUTION : shows possibility of danger.

If this dangerous situation is not eliminated it can cause small or middle injuries

The ATTENTION shows the most general dangerous situation.

2.4. SAFETY DECALS

The secure matrices must be well read without any damages.

If it is necessary the sound matrices should be acquired at the local GRÉGOIRE-BESSON dealer instead of damaged.



READ THE MAINTENANCE INSTRUCTIONS

Before the operation read the safety rules and maintenance instructions and while using the machine take it into the consideration.

Reference: UI 1810



BLOCKING BEFORE THE OPERATION

Before any action on the machine, use the blocking system.

Reference number: UI 1812



GO AWAY AND STAY FAR FROM THE MACHINE

Danger in the working zone.

Reference : UI 1805



LIQUID LEAKAGE AND MAINTENANCE

Be careful of the liquid leakage under the pressure.

Reference: UI 1804

Operation manual of plough RW 47



TRANSPORTING ON PUBLIC ROADS

Keep the maximum speed limit.

Reference: UI 1807



ATTACHMENT OF PLOUGH

During the attachment of the plough immobilize the tractor and follow the safety notes.

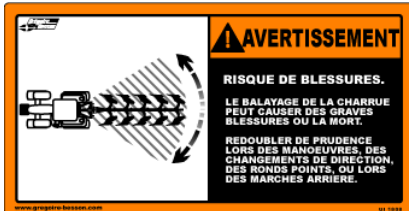
Reference: UI 1806



DO NOT PUT YOUR LEGS UNDER ROTATION PARTS

Keep the safety distance from plough when lower it to soil.

Reference: UI 1813



ZONE OF SWING

Keep distance from zone of swing when open the machine or turning whith it.

Reference : UI 1808



DO NOT CLIMBE THE PLOUGH

Keep the safety distance from the moving plough.

Reference: UI 1802



DO NOT ENTER UNDER THE PLOUGH

Lower the plough to ground if necessary any intervention.

Reference : UI1803



DO NOT PERFORM ANY MODIFICATION IN THE HYDRAULIC ACCUMULATORS

You must not execute any modification on the hydraulic elements.

Reference : UI 1801



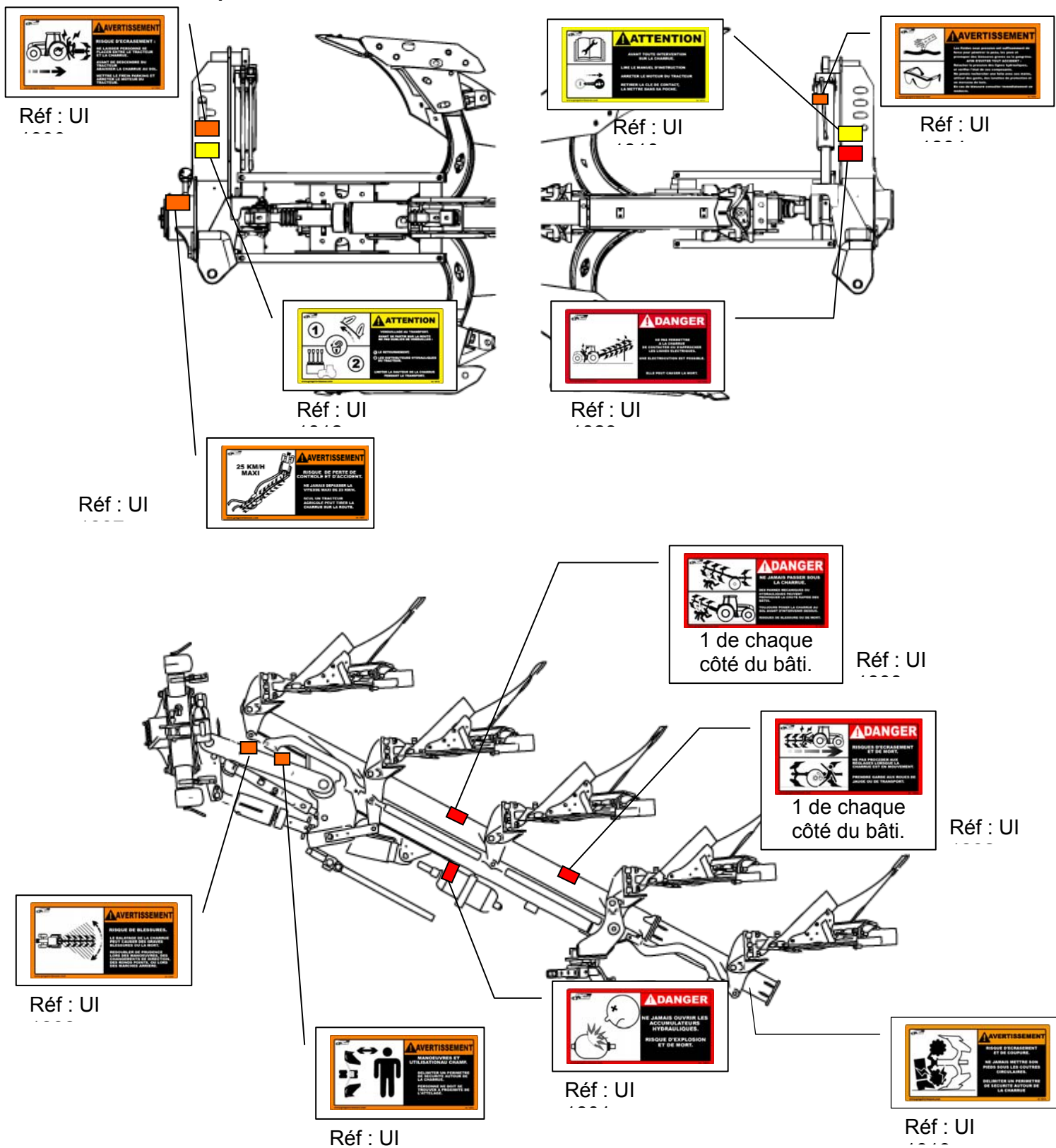
DO NOT APPROACH OR CONTACT WITH ELECTRIC WIRES

Keep safety distance when manouevering near electric wires with plough.

Reference : UI 1823

Operation manual of plough RW 47

Schéma des emplacements des autocollants de sécurité sur la RW 47.



2.5. FOLLOW THE SAFETY INSTRUCTIONS



Have time to read the safety instructions or the messages on the mounted matrices.

The safety matrices should be in good condition.

Put the new ones instead of damaged or missed matrices!

Do not remove safety elements!

Control if all the new spare parts are provided with suitable safety signs!

The changeable matrices and safety signs can be got at the local GRÉGOIRE-BESSON dealer. Apprendre à faire les réglages de façon logique et adéquate.

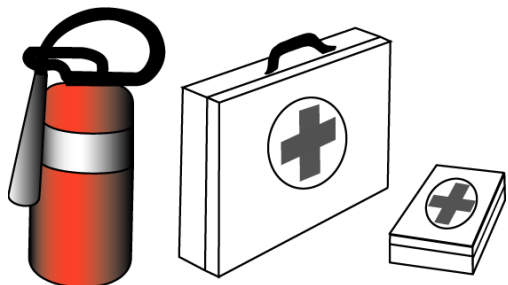
Learn the acceptable machine utilization.

Acquire reasonable and acceptable adjustments.

- Do not stop learning before your acquire everything!
- Do not allow to use the machine to such a person who has not participated in the training!

Keep the machine in good condition. The unacceptable maintenance and modifications can damage the plough operation, its safety, its endurance and durability. The GRÉGOIRE-BESSON company is not responsible for performance of any modification on the original construction.

2.6. BE PREPARED FOR CRITIC SITUATIONS



Show precautions attitude:

- Always think of possibility of fire formation!
- Fire-extinguisher and first-aid pack should always be near by.

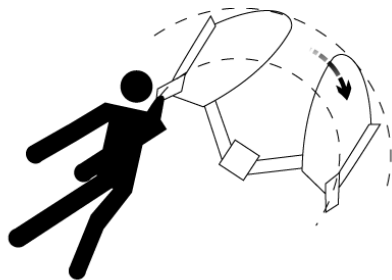
Pour prévenir tout risque d'incendie :

- Keep the machine and accessories clean!
- Clean the plough from plants, straw and leaves, as well as from the lubricant overflow!



- Systematically check the fire-extinguishers and be sure that they have enough coagulation!
- Systematically check the fire-extinguishers and be sure that they have enough coagulation!
- After the usage the first-aid pack should be filled again!
- Have the telephone with aid numbers (doctor, ambulance, hospital, fire-brigade and service) near by!
- If the operator or mechanic works alone let his family or neighbors know about the type of his work, the place and the time of coming back!
- They should have CB radio or (charged) mobile telephone to get quick help in the case of emergency.

2.7. DO NOT WEAR LOOSE CLOTHES



Do not wear large clothes, because they can be caught in the machine or in moving spare parts and some parts of your body can be rived. For the work you should wear suitable and of good size clothes. If you have long hair you must bind up it.. Rings, watches or other jewelry can be caught that is why you must take them off before every maintenance or adjustment.

2.8. WEAR PROTECTIVE CLOTHES



The usage and maintenance of a plough requires special clothes wearing, for instance, secure boots (thick), gloves and goggles (shield).

Besides the prolonged noise injury can cause impairment of hearing or even surdity.

Wear protecting auditive appliance for example, ear-protector or ear-plug to reduce the noise in the working environment.

If special mechanical work should be done, use secure and protective equipment and other means (protective masks, eye-preserves, welder's helmet etc.)

This equipment can be got at your dealer or middleman.

2.9. BE CAREFUL AT STARTING IN ORDER TO AVOID DRIVING OVER

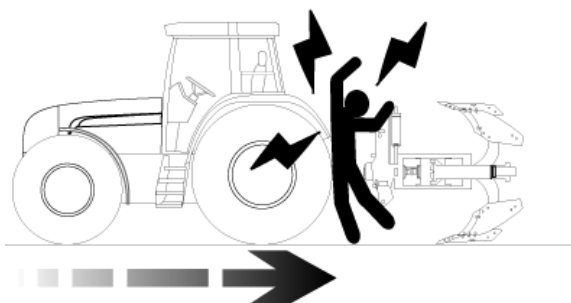
Avoid all such damage or danger of being driven over.

- Do not try to start the engine with short-circuit because the tractor can start at a high speed abruptly.



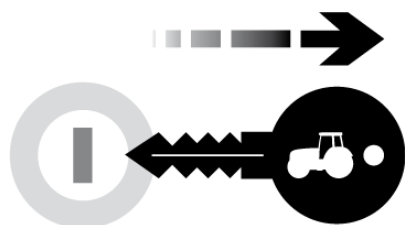
- Do not start the tractor from outside standing on the ground. Start it only being in the cabin.

2.10 BE CAREFUL OF THE DANGER DURING THE PLOUGH ATTACHMENT AND UNHITCHING



- DO NOT ALLOW ANYBODY to stay between the tractor and the plough especially during the plough attachment and unhitching while reversing.
- Before getting off the tractor to unhitch the plough put the gear into the «Parking» position, put on the brake, stop the engine, take out the ignition key and put it into your pocket.
- Before unhitching the plough put it totally down on the soil, control if the brake-block is on the plane solid surface of the ground.

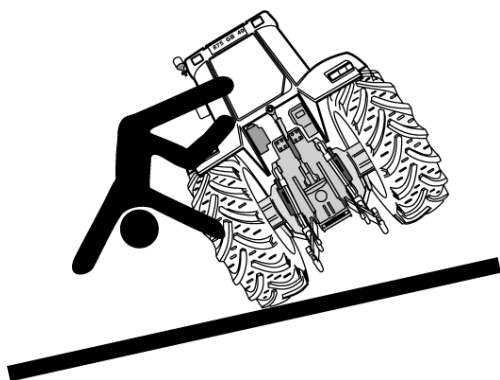
2.11 TAKE THE IGNITION KEY OUT



- When you stop the tractor only on short period of time, put the gear in the „Parking” position, apply the hand-brake and stop the engine.
- Take out the ignition key and put it into your pocket.
- Never leave the driving cabin before having put the plough on the ground.

2.12 THE RISK OF TRACTOR OVERTURNING

- Be careful going up or down the hills!
- The tractor can be overturned because the soil can be hilly or because of animals underground holes.
- Do not go near to ditches or rivers. Water and animals can gully out a hole which may collapse under the mass of a tractor.
- Check the ground by standing on it before you go there by tractor.

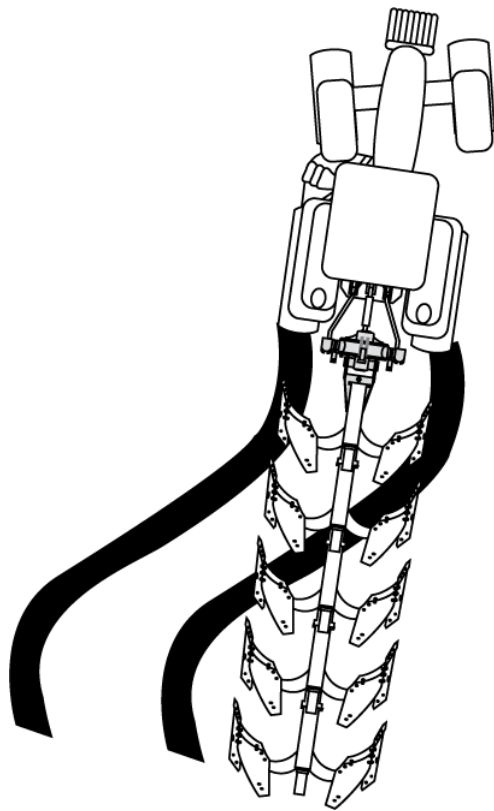


2.13 BE PRUDENT WHILE DRIVING ON PUBLIC ROADS

When you are driving on the public road ploughs must be put in the transporting position.



- During maneuver be sure there is nobody near the plough.
- Control the attachment of the 3 point mounting of the shaft (the presence of secure bolts and secure pins) and the blocking of the reverse during the transporting.



After the preparation for transporting let the transportation wheels down and tractor lifting device in such a way that tilting of the lifting lever should be reduced. Take care that the rear depth adjusting wheel should be untouched.

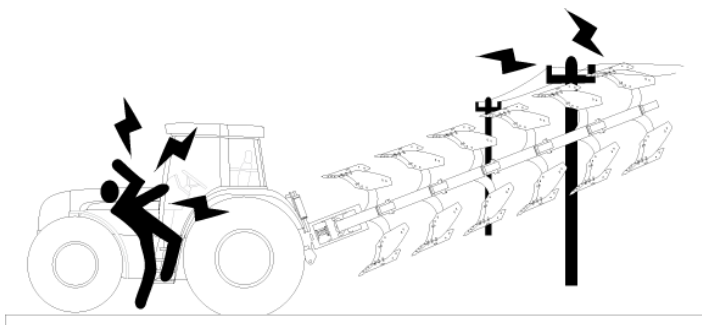
- Connect back to maximum the hydraulic working width and the cylinder performing the front furrow regulation. With this performance the center of the plough can be put lower.
- If the plough is in the transporting position, from the cabin we should block the unnecessary controlling levers (or hydraulic distributor). This way you can avoid every accidental motion.
- Only an agricultural tractor must be used for plough pulling on roads. This tractor should have the same size and power as for plough. Do not use other vehicles or tractors with less power or mass.
- The speed should be suitable to be possible to rule the machine under any other conditions. Keep all the rules of driving and speed limit. Low the speed at the bends and take into the consideration maneuver of other

vehicles.

- Choose the speed and driving style accordingly with the area and traffic conditions. Be very careful and prudent!
- Under all conditions and mainly going down or up the hills drive at low speed, first of all at the bends and avoid sudden directional change.
- Moving down or up the hills avoid abrupt braking or starting.
- If you use the machine on the public roads, follow Highway Code. The owner or the user must be informed about the rules in the given country. They should follow the rules and ask the dealers to equip the machines with required devices.
- **In the case of mounted ploughs you should pay great attention to the traffic especially in the round-about do not allow other vehicles to come closer to the plough. Take into the consideration the plough swinging.**
- **During the transportation do not let tractor to change the direction because of the plough wheels going on the hilly roads in order not to cause the accident.**
- The bolts, screws can be loosened because of the vibration. You must always control their fastening before participating in the traffic.
- Be attentive with other drivers. It makes the good connection with your neighbors easier and contribute to the positive image of agricultural world.

2.14 PAY ATTENTION TO THE ELECTRICAL WIRES

- Pay close attention especially when you maneuver near the electrical wires. The electrical shock exists even if you do not touch them. They may cause serious injury or even death.
- Especially pay attention if the tractor equipped with the accumulator charging unit.
- Be careful if it is turn-wrest plough or the rear part can be hydraulically turned up.



- Keep the safety distance between the plough and electrical wires especially during the maneuvered as well as during going up and down.
- If the machine touches electric wires immediately stop the

tractor and apply the parking brakes.

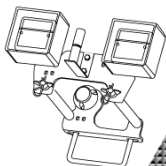
- Make sure that you can move out of the present situation without touching the electrical wires.
- Do not touch the electric wires till the voltage has been eliminated.
- Everybody who tries to approach the machine must be warned and asked not to touch the machine till the voltage has been eliminated.
- Take into the consideration the radio or CB aeriels or any other later mounted supplements which can change the height of the machine.

2.15 SIGNAL THE POSITION OF THE MACHINE



Regularly examine the condition of the lamps and reflectors according to the rules. Use them accordingly, clean them, they must work correctly and be seen by other drivers.

- Keep the safety equipment in good condition.



- Clean the equipment from dirt, dust and other residues.
- Change the burnt lamps, repair or change damaged or lost signals.
- Head lamps, flash signals, blinker lights and red reflectors must be used accordingly on the tractor and on the plough as well during the day time and during the night.
- Place the slow vehicle sign or use the head lights during transporting on the roads.
- The signals kit can be purchased at the GRÉGOIRE-BESSON dealer.

The owner or the user are responsible for well-seen signals during the traction and for keeping laws and rules.

2.16. CHECK THE WHEELS (TORQUE, STATE AND PRESSURE)

BEFORE DRIVING ON PUBLIC ROAD, CHECK THE WHEELS BOLTS, THEIR FASTENING, AND IF IT IS NECESSARY TIGHT THEM, SYSTEMATICALLY CHECK THE TYRE PRESSURE.



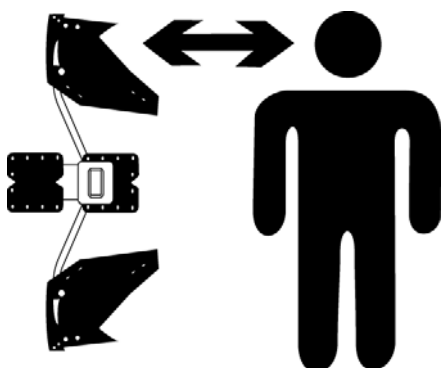
- Examine the tyres at every wheel, inner tube, hubs and hub bolts.
- Never drive with very high or very low wheel pressure, if there are cuttings or tyres are damaged or wheel bolts are loosen or missed.
- If the pressure in the wheel is too high or too low there is the danger that the plough begins to jump.

ATTENTION:

The plough with bolted lock-jointed tyres requires more attention than finned profiled wheels. Because on the land the vibration of the bolted lock-jointed tyres is greater on the roads than in the case of plane tyres.
So wheel bolts can be easily loosened.

2.17. UTILIZATION AND MANOEUVRE ON THE LAND

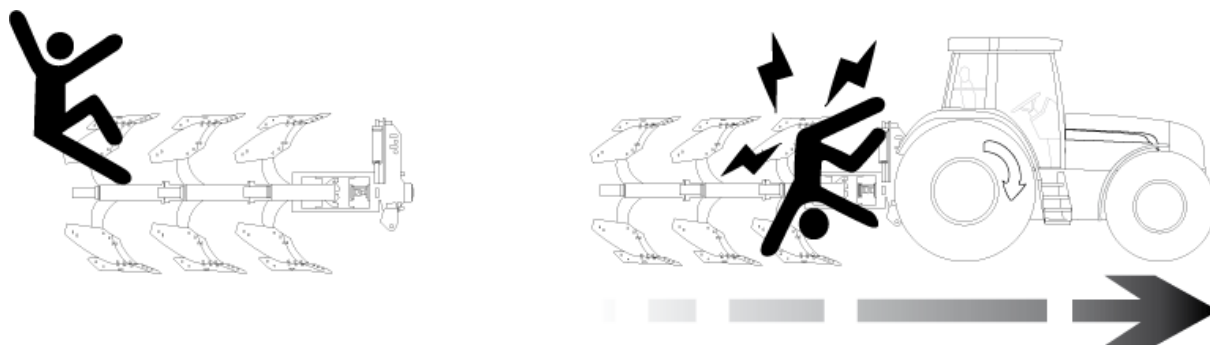
- The safety zone should be marked for other persons.
- Be sure that there is nobody near the area of plough operation.
- Be sure that there is enough place for safety maneuvering of the pulled unit.
- At the end of the field reduce the speed at cornering.
- Pay attention that rear tyres of the tractor do not touch the plough during the abrupt cornering.



Tenir les enfants éloignés en permanence de la machine.

2.18. NEVER CLIMB TO THE PLOUGH

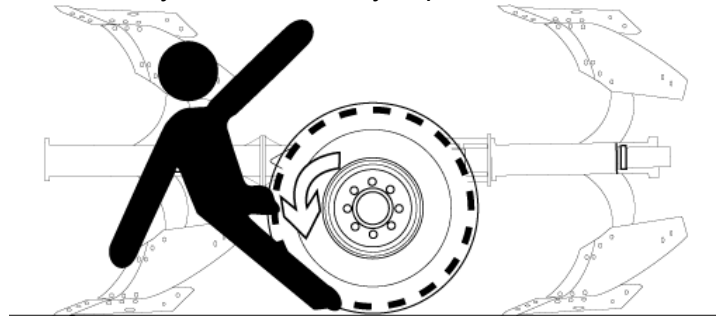
DANGER Either during parking or during moving - NEVER climb to the plough.



2.19. DO NOT PERFORM ADJUSTING ON THE MOVING PLOUGH

DANGER: RISK OF SERIOUS INJURY OR DEATH.
NEVER TRY TO ADJUST, CLEAN OR GREASE THE MOVING PLOUGH!

If somebody tries to do any repair work on the moving plough, it can be very dangerous



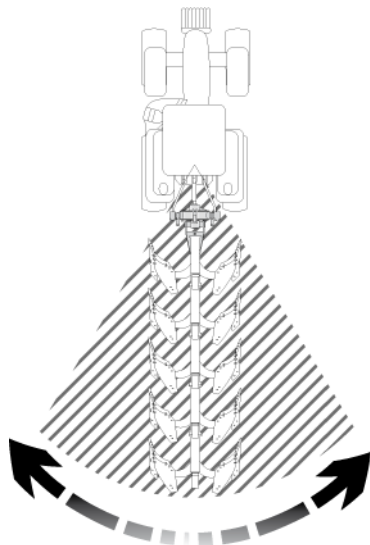
because of sudden jerking or losing the balance or abrupt maneuvered or because of something else the foot or leg can slide and be caught by the machine. Because of the falling the person can be injured or even killed. It is serious risk of life.

2.20. WATCH THE DANGER OF CUTTING OR GETTING NIPPED



- Never interfere with your hand or foot into the moving parts.
- The mobile, moving parts can cause cutting, getting nipped or getting injured during the plough work or attaching on or off.
- If the plough is equipped with disc coulters they may cause serious injury if you fall under the plough.
- They can be fatal injuries.
- Be very careful of different injuries, cuttings and getting nipped. Your hands and feet or legs are the most endangering parts of your body.

2.21. PAY ATTENTION FOR SWINGING



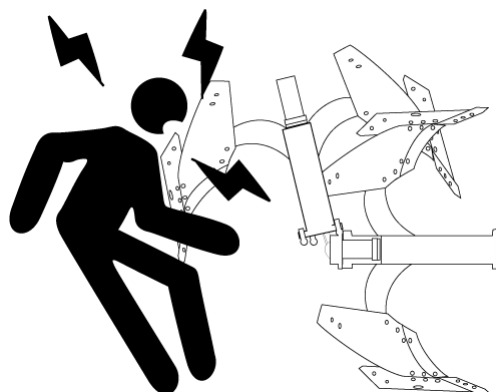
Be careful during the swinging of the moving parts (front furrow width, changeable width, securities, lifting, plough turning up, reversing etc.).

Pay attention that nobody and nothing should be in the area of plough motion.

And even pay double attention during maneuver, change of direction or backing.



2.22. PAY ATTENTION TO THE PARTS UNDER PRESSURE



Nobody must stay behind the plough safety (non-stop or shearing) or any other unit under pressure. A bolt, spring, oil or any part of the machine being disengaged can cause serious injury or even death. The rear window of the driving cabin must not be opened during the work or movement.



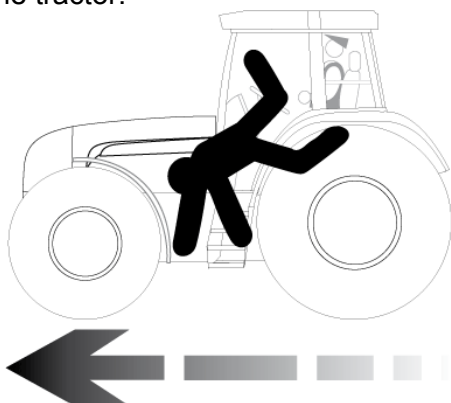
DO NOT LET ANYBODY APPROACH THE NON-STOP SECURITIES OR ANY OTHER CONNECTING POINT OF THE SHAFT.

Do not touch stucked securities. Csult your GRÉGOIRE-BESSON dealer.

2.23. NO PASSANGERS ON THE TRACTOR

Only tractor driver can be on the tractor. **NOBODY ELSE ! ! !**

The most frequent cause of death or injury is that the passanger falls out and is run over by the tractor.



- You must not take any passanger.
- During jerking a passanger can fall out of the tractor.
- They obstacle the view of the tractor driver and can move at a very bad time and move the direction levers. Such usage of the machine can not be called careful.
- Do not let approach the machine to any visitor especially children. Keep the safety distance near the tractive equipment being in motion.

- During the usage only ONE person can stay in the tractor and it is the tractor driver.

2.24. PAY ATTENTION TO THE FLUIDS AND GASES UNDER THE PRESSURE



- Because of outflow of fluids under the pressure you can be injured if it penetrates on your skin or into your eyes.
- In order to avoid the accident before the connecting or disconnecting the hydraulic tubes you must always cease the pressure. That is why after stopping the tractor and disengaging the plough and putting it on the ground, move the hydraulic distribution lever from the front – back in order to discharge the oil from the pressure.

Operation manual of plough RW 47

- Before the putting the hydraulic system under the pressure examine the units, connecting parts (joining, tubes, their flexibility) if they are under the suitable conditions.



- Wear thick gloves and goggles.
- NEVER try to find leakage with your hand.
- Use a stick and wear thick leather gloves.
- For the better safety use suitable goggles.
- Keep away from any kind of leakage.
- In consequence of any fluid under the pressure you are injured at once to see a doctor! Any fluid which penetrated onto your skin, remove it as quickly as possible or it may cause gangrene which leads to amputation or even death.
- Every doctor who do not know this type of injury should turn to the specialist.

2.25. PRECAUTIONS IN THE CASE OF PLOUGH WITH LARGE QUANTITY OF RESIDUE OR VEGETATION

If we use the plough on such fields where there is large quantity of stubble residue or vegetation (corn, green manure) it is important to examine if the bottom pins of the pulling device have been properly attached and the present of the safety-pin as the corn stems sometimes can tear them out.

Under such conditions it is recommended to mount the safety-pin protection or use lock bolt or brake-screws. Connect the GRÉGOIRE-BESSON dealer who can give you good advice.

2.26. PREPARATIONS FOR MAINTENANCE AND SERVICE

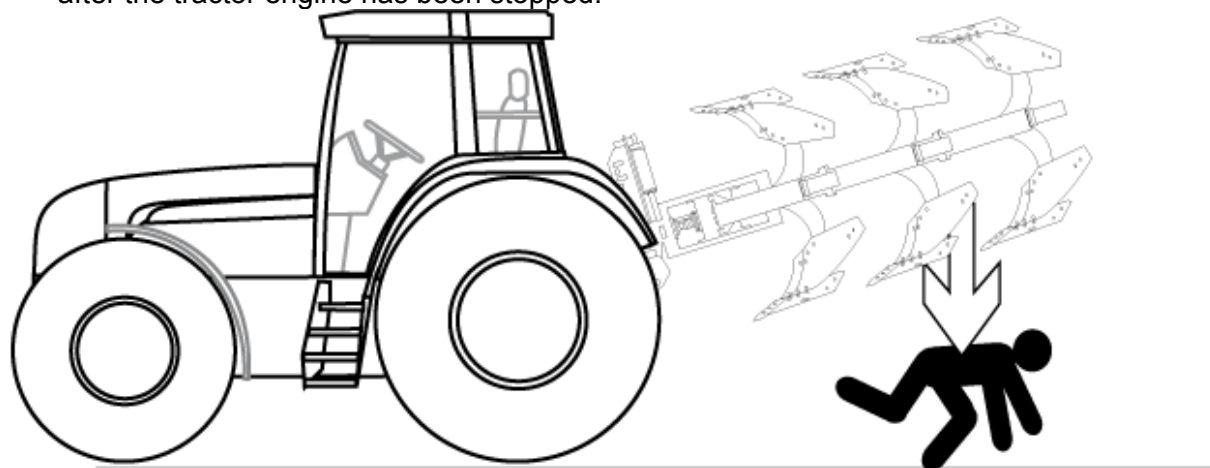
- The machine owner or user is responsible for maintenance.
- Before every usage examine the equipment and machine blocking system.
- Systematically examine the connections and tubes condition.
- Be completely aware of the machine maintenance before you perform any the smallest intervention.



- The instructions about precautions of maintenance and usage of the machine you can find in the chapter <Greasing and maintenance>.

2.27. PRECAUTIONS IN THE MACHINE-SHED

- At placing the plough in the machine-shed always put it on the ground which must be clean, even and stable.
- Use the brake-block to prevent the plough from moving during or after the disengagement.
- Put the support under the plough wheels.
- NEVER leave the machine in the lifted or instable position.
- Suppress in the hydraulic circulation the pressure with the help of the moving levers back after the tractor engine has been stopped.



- The plough should be place far from any human activity.
- The plough must be put in dry, dust-free place with retracted cylinder bars in order to avoid formation of rust.
- Certain wheels can freely circulate, never lean over them or put something on them which can fall.

ATTENTION: Do not allow children to play near or on the plough.

2.28. REMINDER

The best assurance against the accidents is ATTENTION AND PRUDENCE of a user.

If you are very tired or in a hurry the possibility of the accident will increase.

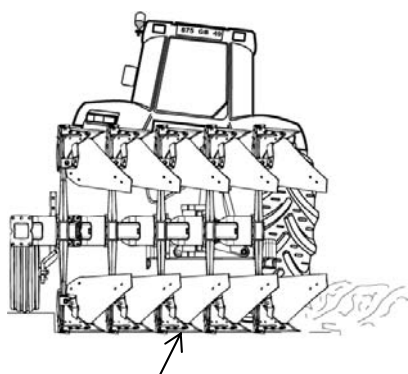
If you have any questions about any part of the instruction or about the machine itself connect the GRÉGOIRE-BESSON dealer or constructor.

3. DESCRIPTION OF THE PLOUGH

A GRÉGOIRE BESSON SP 9 Compact is semi-mounted, reversible, articulated plough with 4 to 8 plough heads.

3.1. GENERAL CHARACTERISTICS

3.1.1. DETERMINATION OF THE RIGHT AND LEFT SIDE OF THE PLOUGH



The parts on the ground are right

The right and left side can be defined if we stand behind the machine in the direction of the tractor and look in the direction of pulling.

We use the same principle during the definition of the wearing parts (blades, mouldboards, gib heads etc.)

Following this principle the blade mounted to the right side is called right-handed, if the mouldboard puts soil to the right side, it is right-handed mouldboard.

3.1.2. THE IDENTIFICATION OF THE RIGHT OR LEFT WEARING PARTS

On the reversible ploughs most of the wearing parts have right or left identification. These parts comparing to the direction of the plough going are symmetrical So it is difficult to decide where to mount this part to the right or left side on plough.



For the easier recognition of the part the GRÉGOIRE-BESSON applies a very simple principle.

On every wearing part for identification of the right or left side the number has been

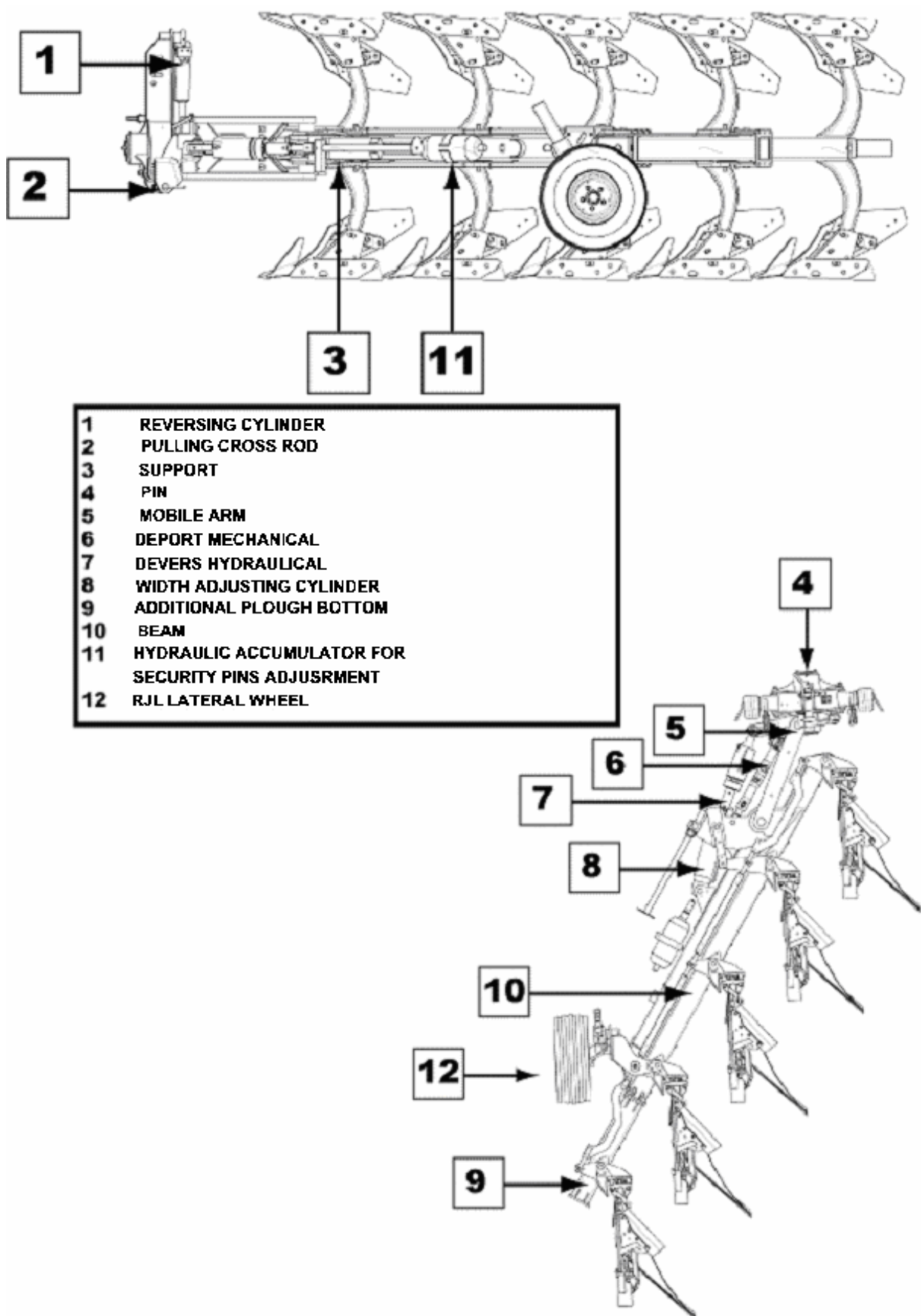
If the last number of the identification is even – it is the right hand part, if the last number of the identification is odd – it is left-hand part.

If the identification number finished PAIR NUMBER => RIGHT part,

If the identification number finished IMPAIR NUMBER => LEFT part.

The presence of the GRÉGOIRE-BESSON logo on the wearing part guarantees that it is original GRÉGOIRE-BESSON spare part.

3.2. GENERAL VIEW



Operation manual of plough RW 47

For optimal usage of the plough work there are a lot of possibilities.

The GRÉGOIRE-BESSON dealers know well the environment and soil conditions where ploughs will be used. If necessary they can help you in the choice of engineering decision and can show you innovations (new optional possibilities, new models).

Be sure to turn to the GRÉGOIRE-BESSON dealer to discuss the plough technique.

The GRÉGOIRE-BESSON firm is present at fairs and professional exhibitions.

3.3. SPÉCIFICATIONS DE LA CHARRUE RW 47

Partie	Équipements standards	Équipements optionnels
Hitch	Category II and III.	- Front hitch (RHAS). - Automatic hitch.
Reverse	Hydraulic with automatic cylinder.	Repositioning the plough devers or working width during revers.
Beam	Chassis 120 x 120, additional plough head possible.	Additional plough heads.
Variable working width with hydraulic adjustment.	From 12" to 20" plough distance 90 cm and plough distance 100 cm.	From 12" to 18" plough distance 90 cm and from 14" à 20" plough distance 100 cm with security <C>.
Adjustment devers	Mechanical arm.	Hydraulic cylinder.
The adjustment of first furrow (deport).	mechanical arm.	Hydraulic cylinder, adjustable during work.
Plough bottom distance	90 cm (= 35")	100 cm (= 39")
The height of the end	160 cm (= 63").	150 cm (= 59") 170 cm (= 67")
Staff clearance	74 cm (= 29")	69 cm (= 27") 79 cm (=31")
Securities	- Light srew security. (C) - Screw: At the turning the plough do not hold plough mass by this the staff damaging can be avoided. (B) - Naud security. (N) - Non Stop Hydraulic type Y: Lifting under ≈: 85 cm	Security mechanical cut off. (S)
Branchement hydraulique	- Reversing + dévers hyd. Auto + width cylinder: 2 DE - Reversing + deport hyd. Indep. + width cylinder with memory: 3DE	
Wheels	- Wheel of depth, strenght on shock absorber : RJR rear position. - Wheel of depth lateral: RJL lateral position. - Double wheel combine field and transport DRL20 lateral position	

Operation manual of plough RW 47

Partie	Équipements standards	Équipements optionnels
Plough ends	- Plough heads with self-edging blades and reverse chisel ends or square rod from 30 - Moulboards : short screws (H4 / H5), or American (3A / 5A), or Cylindrical (C 14 / C 16 / P 14 / 16) - Spade on sole - Cross joint adjustment	- Choix de versoirs (hélicoïdaux longs, claire-voie, plastique, ...) - Rallonges de versoirs. - Soc bec de canard, corps à barres (carrelet de 35 x 35 mm). - Choix des largeurs de lames (socs) : 14", 16", 18".
Supplementary for wearing parts		- Profiled chisel end, - Deflectors, - Short coulter wing-end, - Long coulter wing end, - Furrow widening, - Panbreaker.
Skim coulters	- Can be adjusted vertically, forward and back. - Pin protection security - Mixed type or for dunging	Other models: Universal, Euro. Corn

3.4. DIMENSIONS AND WEIGHT OF PLOUGH RW 47

Nr of plough	Beam	Distance of plough ends	Work width		Total lenght (approximately)	Weight approximately
3 corps	3	90 cm (35")	11" à 20"	84 à 152 cm	3.50 m	1550 Kg
4 corps	3+1 4	90 cm (35")	11" à 20"	112 à 203 cm	4.40 m	1800 Kg
5 corps	4+1 5	90 cm (35")	11" à 20"	140 à 254 cm	5.30 m	2050 Kg
6 corps RC 47	5+1	90 cm (35")	11" à 20"	168 à 305 cm	6.20 m	2000 Kg

Nr of plough	Beam	Distance of plough ends	Work width		Total lenght (approximately)	Weight approximately
3 corps	3	100 cm (39")	12" à 22"	91 à 168 cm	3.70 m	1590 Kg
4 corps	3+1 4	100 cm (39")	12" à 22"	122 à 224 cm	4.70 m	1840 Kg
5 corps	4+1 5	100 cm (39")	12" à 22"	152 à 280 cm	5.70 m	2100 Kg

The weight of plough contain the following parts:

- Security hydraulic,
- Head RHAD 115
- Wheel RJR 10.0/75-12
- B2 plough head 16" with H5 moulboard,
- Mixed type jointers,

Operation manual of plough RW 47

Weights per socks depending different securities for RW 47.

Type of securities.	Weights per socks in Kg.
Shearbolts safety device « C »	31 Kg
Shearbolts safety device « B »	67 kg
Mechanical safety device « S »	107 Kg
Mechanical auto-reset safety device Naud « N »	125 Kg
Hydraulic auto-reset safety device « Y »	97 kg

Poids des supports et des pneumatiques qui peuvent composer la roue sur la RW 47

Megnevezés.	Weights in Kg.
Support of wheel.	
Support RL93	47 Kg
Support RJR	75 Kg
Support RTT85	47 Kg
Support RTTA92	83 Kg
Support RJL	41 Kg
Support RTTL92	84 Kg
Support DRL20	121 Kg
Tyre	
600 x 9	13 Kg
200 x 14.5	24 Kg
10.0 / 75 x 12	28 Kg
26 x 12.0 - 12	27 Kg

3.5. WARNINGS IN CONNECTION WITH GRÉGOIRE-BESSON EQUIPMENT AND TECHNIQUE PARAMETERS

For better development of the product and implementation of the new technology the GRÉGOIRE-BESSON company has the right to change the mechanic characteristics of the equipment, used material and the construction without advanced reporting. After selling and delivering of the product the company is not obligatory to perform the changes. Every data about size and mass can be varied depending on the equipment or options. The illustrations can show optional additions and it is not sure that the accessories belonging to this series would be presented. For the sake of your security:

- Before starting to use the agricultural machine, examine it, the attaching part, the wheel bolts fastening, the condition of the signals used in the traffic and their adjustment.
- Use the equipment accordingly to the agricultural working conditions.
- Take into consideration every warning about danger.
- Use the protective equipment.
- Wear suitable clothes and security equipment.
- Keep the traffic rules Highway Code of the given country.

3.6. THE PRINCIPLE OF THE REVERSE PLOUGH

The GRÉGOIRE-BESSON Compact plough is the reverse plough . The principle of the reverse plough make it possible that during the plough of the land to throw earth to the same side, it does not matter which direction we perform the work. At every field end the plough reverse and the tractor is going in the furrow which was previously left. After the plough we can see plane unified land where a furrow cannot be seen. By this the better sowing and plantation can be provided. The reverse plough is economic as at the end of the field it needs less maneuvering. Differently from the bed plough the reverse plough do not compact the soil at the end of the field as on the same place it is going only once.

Another advantage of the reverse plough that you should not wait till the whole field would be cropped in order to start the plough operation.

3.7. REVERSING HEAD

The GREGOIRE-BESSON RW 47 plough equipped with two different types of reversing head.

Headstock triangle RHAD 115:

- Head triangle
- Compact pin (limit the effort on the pin) and creuse (absorb the shocks)).
- Set the vertical position independent it is on right or left side.
- Trigger opposite side of reverse unit (limit the deformation of cylinder rod and the shock at the hydraulic distribution house).
- Fix hitch in holder, width n°2 et 3 cat.III



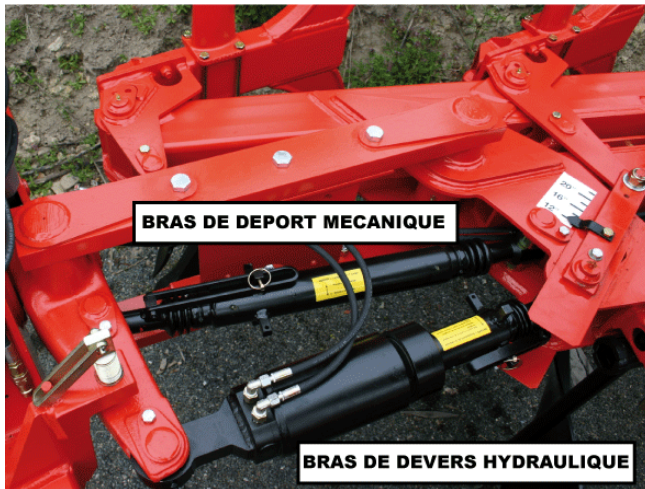
Headstock reinforce RHAS 115:

- Head triangle reinforce
- Diameter of pin 115, with support reinforce pin.
- Hitch reinforce.



3.8. THE RELATOIN OF FRONT PART OF BEAM

The relationship adjustable by parallelogram system (multi-positions). The two adjustment important in changing the position of bean in relation to mounting head.



- Deport: adjust the width of first furrow.
- Devers: adjust the position of plough in relation to tractor.

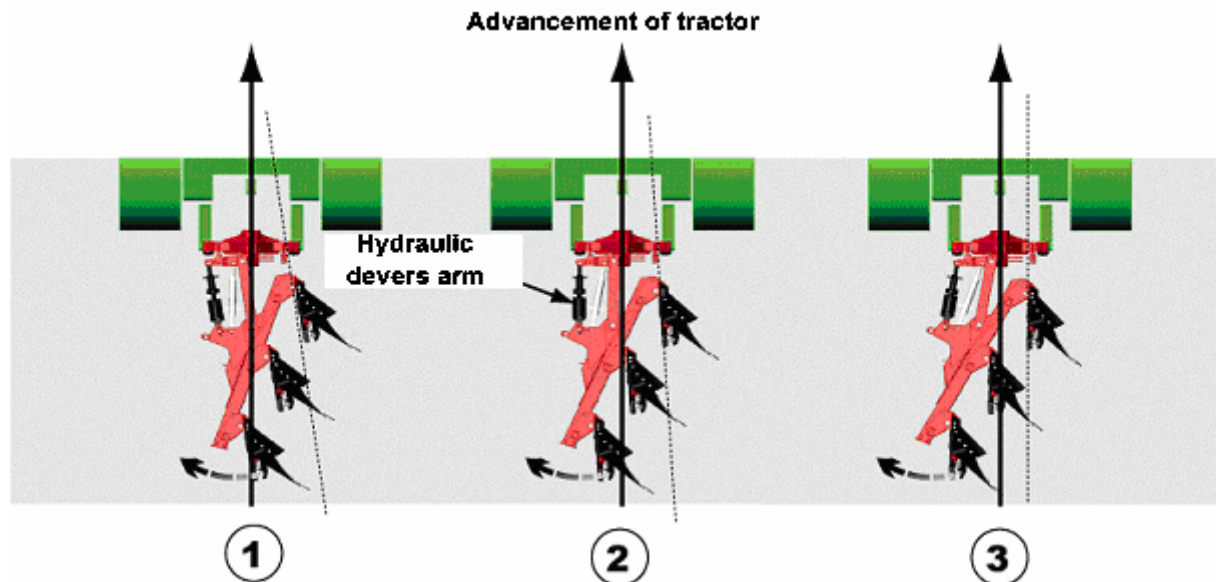
Exist mechanics and hydraulics solution for adjustment.

DEVERS ARM: The outer arm of parallelogram.

The devers bar (alignment) array the socks an best aviable degree in relation to tractor advancement.

If with the tractor drive on non-ploughed part and the plough on ploughed part, increase the lenght of devers arm.

If with the tractor drive on ploughed part and the plough on non-ploughed part, decrease the lenght of devers arm.



Operation manual of plough RW 47

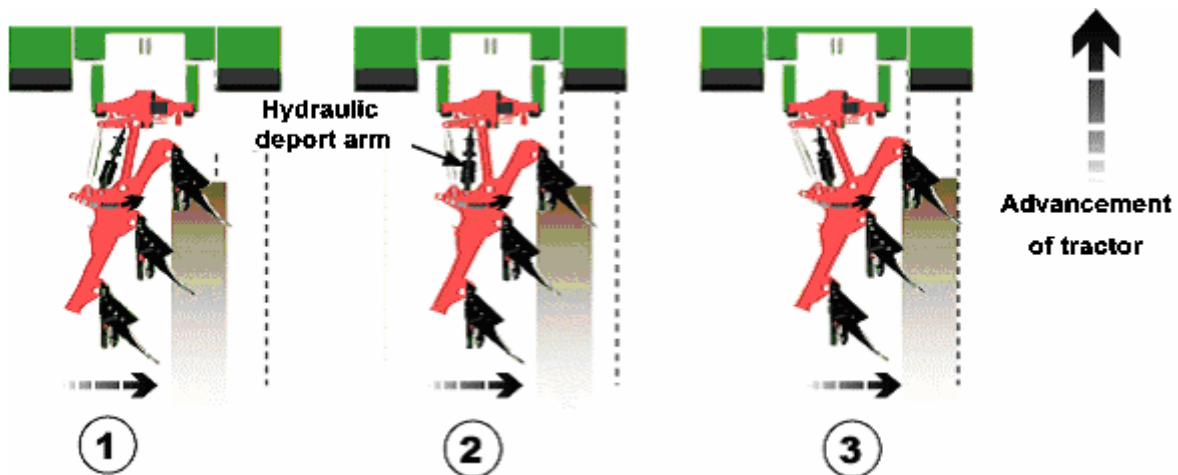
DEPORT ARM : The outer arm of parallelogram.

With deport arm adjustable the working width of first sock in interest the working width will be nearly egal with other socks. The adjustment make possibilities, that the next plough fit into previously courses better.

It is possible to pull in the first sock with deport hydraulic arm. If the field is on slope, and the tractor works up it is possible to pull in the first sock, that it isn't work, in this way you can spare energy (the solution is shown on fig. n°3). When the tractor again work on downhill the first sock adjustable again to work position (fig. n°1).

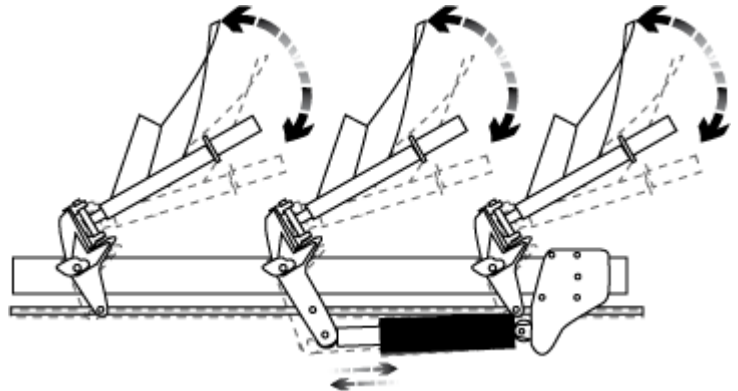
When the arm of deport decrease, the first sock get nearer to previously furrow wall, therefore decrease the working width of first sock.

Inverse the arm of deport increase, the first sock get farther from previously furrow wall, therefore increase the working width of first sock.



3.9. LARGEUR DE TRAVAIL

The hydraulic working width control make a possibilities to change the adjustment of working width without stopping the operation. The plough can conform to soil conditions, the width of furrows is adjustable at last and of the field, insure immediately correction in case deform course, equalization of plough in slopes, in case of blocking release the vegetation with maximum divertation of socks, etc.



System equipped with double rods, it makes a possibilities to distribut the forces which affect to system in interest insure long working life. Moreover insure better controll and easier maintenance for pins with system equipued in outside of the beam. The principle insure the possibilities to fit supplementary socks.



Before begin to operate the hydraulic system from tractor seat make sure, that noboby stay in workin area of implement.

- From 12" to 20" between centre of socks 90 and 100cm.
- Pour les sécurité légère type C :
- From 12" to 18" between centre of socks 90cm.
 - From 14" to 20" between centre of socks 100 cm.

3.10. THE DIFFERENT TYPES OF SECURITIES.

3.10.1. LIGHT SECURITIE « C »

With searing of bolt :

The sock hold an bolt, size 22x80 (10.9).

Depend of operation conditions may be use other size of bolts (from 90 to 130 kg).

The shearing force of standard bolt: 14 x 70 (8.8) VI3010.



3.10.2. SHEARBOLTS SAFETY DEVICE « B »

The all socks are monoblock, which limited the joints and insure some play.

The socks come back in front of obsacle, the shearing of bolt happened effect of shearing force on a level of moving: it makes an determined cutting edge.

Depend of operation conditions may be use other size of bolts (90 à 130 kg).

The shearing force of standard bolt: 16 x 50 (8.8) VI3106.

The shearing force of reinforced bolt: 16 x 50 (10.9) VI3107.



3.10.3 NON-STOP MECHANICAL SAFETY DEVICE NAUD « N »

The spring which fitten to system once able to absorbe the shocks come from obsacles, second insure the fast return to soil for unit.

It seems, the system is simple and reliable: the system integrated to sock, maintenance free, without hydraulics.

The system adjustable, ther is a possibility to adjust the sprig tightening depend to soil condition.

The system with double rods insure large disengagment for socks and better reliability in time.

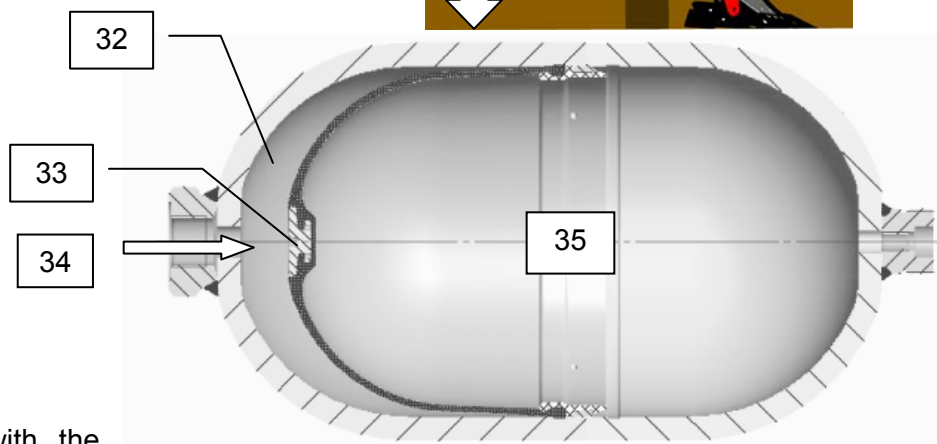
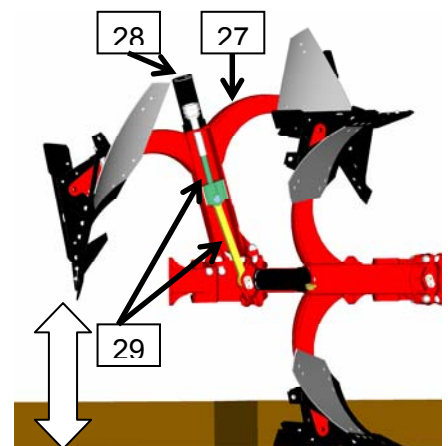
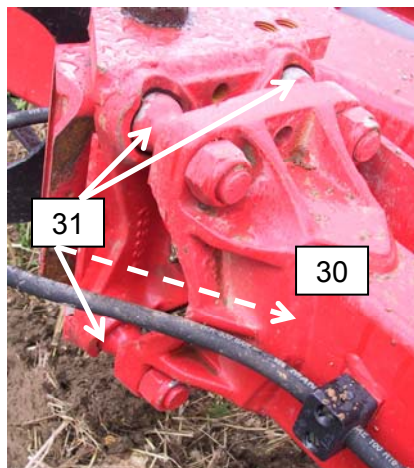


3.10.4. PRINCIPLE OF NON STOP HYDRAULIC SAFETY DEVICE

The hydraulic Non-Stop security elements (27) mechanic circulation connects with close hydraulic circuit which pressure can be changed.

There is one hydraulic cylinder (28) behind every circulating element. It is connected with the frame with the help of the double tringle (29).

The mobile connection between the front part of the tube (30) and the frame of the plough is performed with the help of the 4 axle journal (31).



Every cylinder is connected with the same hydraulic accumulator (32).

The task of the hydraulic accumulator (32) to provide suitable elasticity when the part impacts the obstacle and deflects around the axle-journal.

Inside the accumulator there is a flexible membrane (33) which separates the hydraulic oil (34) coming from cylinders, from nitrogen placed under the pressure (35). The characteristic of the gas nitrogen is that it can be compressed. The gas is compressed in the plant under the certain pressure and cannot be changed.

Anti-bouncing affect can be got by hydraulic oil pressure (34).

- With the injection and the extraction of the oil into and out of the security hydraulic circuit the flexible membran becomes deformed, In this function nitrogen more or less coagulates.
- When the plough head comes across the obstacle the turning of the mechanic disengaging part causes compression. Then the surplus of the oil is absorbed by the accumulator producing the bouncing.
- After the overcoming the obstacle the over pressure in the accumulator gets back into the cylinder and makes the plough heads go back on the soil.

The adjustment of the securities disengaging power is changeable. It is performed with the help of the filler (36) and can be adjusted by manometer (37).



If the variably possibilities of the manometer are not enough, optionally there are two ways to increase the security disengaging power:

- With the increasing of the security cylinder diameter,
- With the usage of the industrial nitrogen adjustment accumulator.

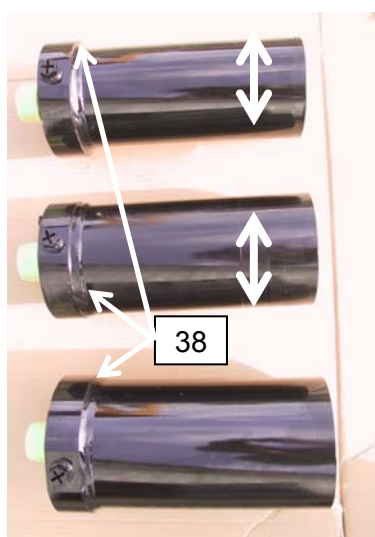
3.10.4.1. Diamètre des vérins de sécurité



The diameter of the cylinder with standar equipment is 90 mm. Optionally there are cylinders of 100 mm, 110 mm or 125 mm diameter as well.

At the given hydraulic pressure the bigger the diameter the more difficult to disengage it.

Height measured at the end	Bulk clearance of the shaft	Security cylinders Ø	Disengaging power measured at the end							
			100 bar pressure with accumulator (with industrial nitrogen adjusting)				150 bar pressure with accumulator (with industrial nitrogen adjusting)			
			Minimal hydraulic pressure 110 bar *		Maximal hydraulic pressure 150 bar *		Minimal hydraulic pressure 110 bar *		Maximal hydraulic pressure 150 bar *	
170 cm	76 cm	90 mm	590 kg	1 298 lbs	800 kg	1 760 lbs	860 kg	1 892 lbs	1 075 kg	2 365 lbs
170 cm	76 cm	100 mm	760 kg	1 672 lbs	1 040 kg	2 288 lbs	1 110 kg	2 442 lbs	1 390 kg	3 058 lbs
170 cm	76 cm	110 mm	950 kg	2 090 lbs	1 300 kg	2 860 lbs	1 390 kg	3 058 lbs	1 730 kg	3 806 lbs
170 cm	76 cm	125 mm	1 270 kg	2 794 lbs	1 740 kg	3 828 lbs	1 850 kg	4 070 lbs	2 320 kg	5 104 lbs



Ø : 90 mm (≈ 3''1/2)



Ø : 115 mm (≈ 5'')

Ø : 100 mm (≈ 4'')

Some cylinders can be easily diversified if at the rear end its diameter is measured.

For the specialist the controlling mode is the distance between the body and the bumped end (38) of the cylinder.

Ø : 110 mm (≈ 4''1/3)

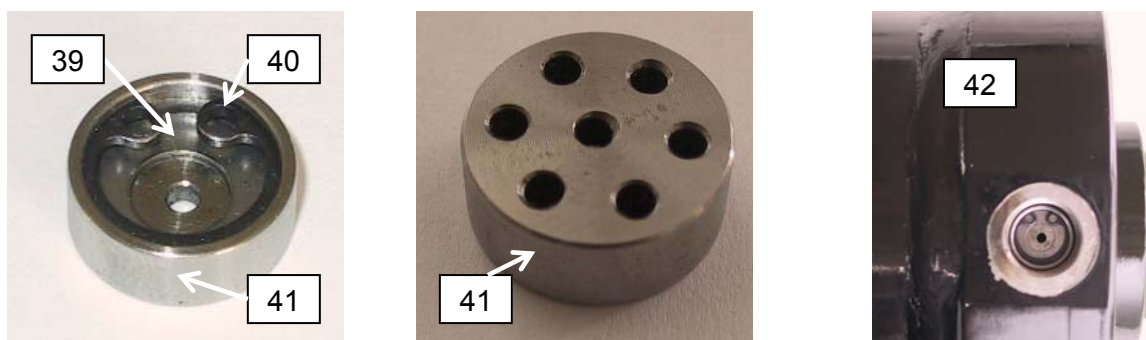
Operation manual of plough RW 47

3.10.4.2. Flow limiting pulley (reference: 1 119 037)

For the work on the extremely gravel soil a pulley has been mounted (GB reference: 1 119 037), which reduces the speed of the oil flowing back into the cylinder whilst keeping the high pressure.

The rattling decreases which protects the security axle-journals.

On the contrary when the plough bottom comes over the obstacle there is no limit for quick oil flowing out.



The principle of the work flow limiting pulley:

Inside the pulley (41) there is a plane spring-washer (39) which fastens circlips (40).

- When the plough bottom disengages, the oil flowing from the cylinder into the whole length catches the spring-washer circlip. The spring-washer provides the oil flowing across several holes in the pulley.
- After the overcoming the obstacle hydraulic system pressure constrains the oil into the security cylinder (42). The oil going back into the cylinder presses down the spring-washer onto the bottom of the pulley. Only the middle hole lets the oil flow back with the help of it its flowing becomes slow.

Pay attention on the direction during the mounting of the pulley (41) into the cylinder (42). The circlip must look outside.



ATTENTION: The pressure must be decreased to 0 bar before starting any interference. Follow the security instructions (chapters «General security instructions» and «Greasing and maintenance»)
If it is necessary ask the help from the GRÉGOIRE-BESSON dealer.

Operation manual of plough RW 47

3.10.4.3. Accumulators

The mounted standard accumulators are used with industrial 100 bar pressure adjustment. The plough optionally can be mounted with 150 bar accumulators.



Externally there is no difference between two accumulators, the nitrogen adjustment can be seen on the label or it is chiseled on the accumulator.

IMPORTANT: In the case of equivalent power measured on the end instead of cylinder with bigger diameter we suggest choosing the accumulator adjusted 150 bar pressure. It provides greater flexibility and there is no difference between 100 and 150 bar nitrogen adjusting accumulators.

During the work if securities seem to be too rigid or soft, ask the advice from the GRÉGOIRE-BESSON dealer to find the most favourable solution.

4. PREPARATION OF TRACTOR BEFORE OPERATION

4.1. NECESSARY TRACTION POWER

The power necessary for plough traction changes in the function of soil structure and working conditions. The data in the table is informative. The GRÉGOIRE-BESSON dealer knows the country very well where the plough is going to be used. He can give some advice not only in the connection with the traction power but the optional possibilities of the required exceeded the time work.

Number of socks	Average soil (15 à 30 % clay)	Hard soil (> 50 % clay)
3 socks	75 - 90 hp	90 – 120 hp
4 socks	100 - 120 hp	120 – 160 hp
5 socks	125 – 150 hp	150 – 200 hp
6 socks (RWC47)	150 - 180 hp	180 – 240 hp

4.2. THE DISTANCE BETWEEN TRACTOR TYRES

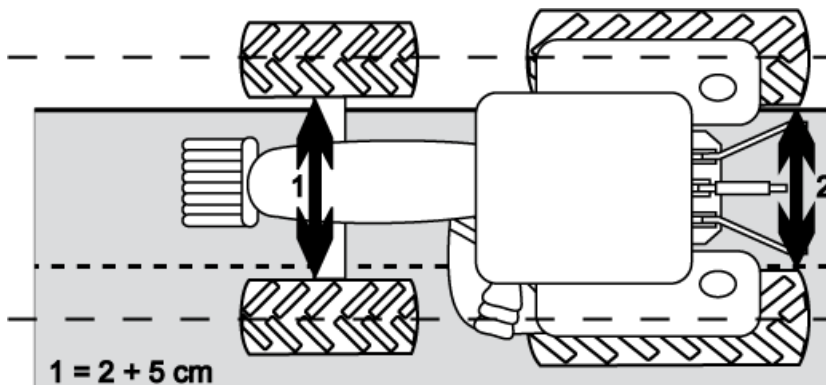


We blow up the rear and front tyres to the pressure specified by the manufacturer. Follow the rules of the instruction and recommendations of the tyre producer.

On the both sides of the tractor the pressure should be the same for the plough to work on the proper level.

In general it can be said that the plough with higher number of plough bottoms with the growing of the tractor wheels distance the traction work will be better and better.

Besides if there is first furrow adjusting cylinder the plough can be adjusted to the tractor width (in the case if we speak about tractor usage, or during participating in the traffic where the width must be limited or more tractors are used with the same plough).



For the tractor going in the furrow in right direction it is recommended that the center of the front wheel should be in one line with the center of the rear wheel. This way the front driven wheel will not drag the furrow side (gravel may damage the tyre side) so the tractor will be easier directed as on the left as on the right side.

The adjustment the distance between tyres depending of working width of each socks and of the lenght of déport arm. For proper adjustment of wheels you can get the correct values, see for more information the chapter 7 «Preparation of the plough before operation».

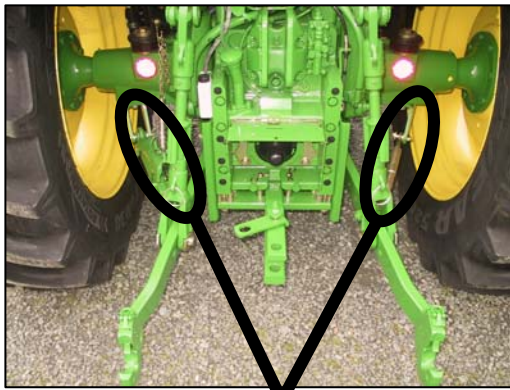
On the hills for the stability of tractor must apply maximum wheel distance (1,70 m).

Distance between tyres minimum: 1 meter.

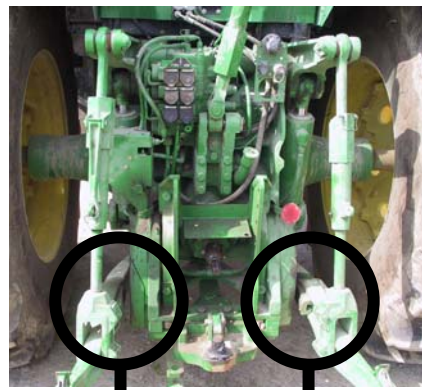
Distance between tyres optimum: 1.45 meters.

Distance between tyres maximum: 1.70 meters.

4.3. POSITION OF SUPORTS / BLOCS OR TIRANTS STABILISATOR BARS



BARS



SUPPORT

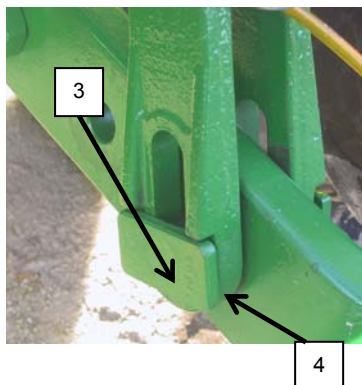


It is easier lubricate and unrust the stabilization screw and pins (rockers and bars) before attaching the plough to the tractor. If it is necessary take time to dismount and adjust these stabilizations and bars in order to perform accordingly the screws lubrication.

The stabilization of rockers and bars must be placed so that during the plough attachment the lifting levers side clearance should be the smallest (if it is possible ≤ 1 cm $\approx 1/2$ ").

If despite the properly mounted stabilizations the lifting levers have big clearance you should get sleeves to avoid to prevent the levers lateral sliding on the pulling spindle. Control if the spindle and the type of the drawbar compatible (category and $\varnothing$).

4.4. AXES DES CHANDELLES DE RELEVAGE



Lifting rod must be vertical to the plates (3) in fixed position (4) to avoid all unnecessary clearance during turning or dangerous jerking.



4.5. THE LENGTH OF THE LIFTING BARS

Examine the proper operation of the vertical bars of the lifting arms. Before attachment to the tractor it is easier to loosen the lifting lever screws and perform their lubrication.



- The lifting bars of the vertical levers must be in fixed position.
- Be sure that both lifting bars are the same length because the difference between left and right lifting bars may result the wrong adjustment of the vertical position. This way the plough can work deeper on one side or the first furrow width will not be suitable.
- The length of the lifting bars affects the position of the tractor lifting levers. The tractor depth controlling will be the better if the lifting bars can oscillate (in the function of loading to let out and pull in).

So it is necessary to adjust the lifting bars length to have minimum 30 mm going (5) to be able to pull them back during the work.

Special attention must be paid if the tractor is equipped with wheels of big diameter.

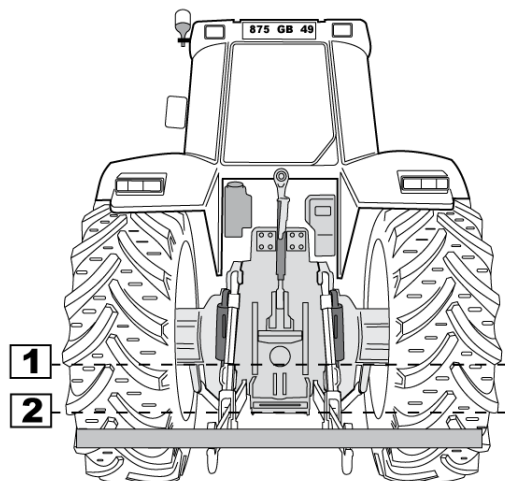
There is a very simple method to make this adjustment.

Prepare one mason ruler or a rod, which put to the lower lifting arms of tractor.

After it find a horizontal mark on the tractor, for example the axle housing (1) or the housing of lower lifting arms (2).

After it move away from tractor some meters and check, that the rod perfectly paralel with mark on the tractor.

Adjust the lenght of arm if necessary.



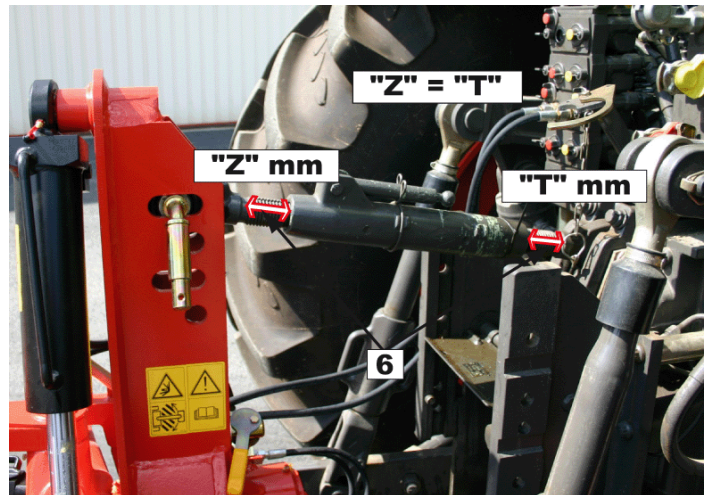
4.6. THE LENGTH OF THE 3RD POINT

The adjustment of the third point is performed when the plough has been attached to the tractor.

At the same time the controlling of the work, loosening and lubrication are much more accessible before the plough attachment.

Before joining the third point to the plough:

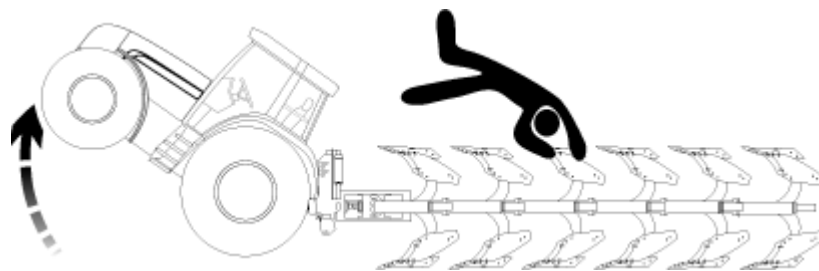
- Examine if the cross-arm perfectly fastened to the tractor two bottom levers.
- Be sure that two screws of the third point are long enough (6) for the central female screws in order not to damage or tear them off during adjustment.
- It must be examined that two edge screw are on the same adjusting level:



Two seen threads (6) should be the same length ($Z = T$). So being maximum screwed the third point must be the shortest. Or vice versa if it is unscrewed it must be maximum long.

NOTICE : Inside the third point the big quantity of the lubricant can obstacle the shortening. On some tractors the lubricant must be cleared away with the dismounting of the lubricator which release the lubricants being under the pressure.

4.7. BALLASTING THE TRACTOR



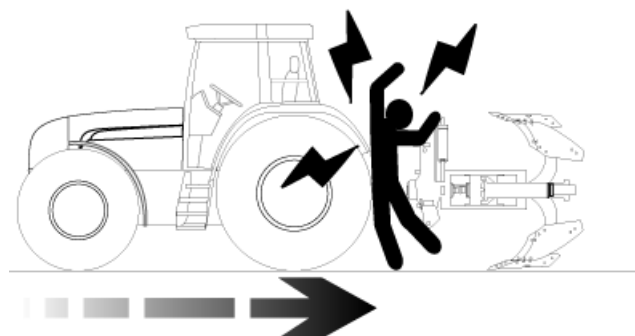
The wheels ballasting (front and back) as well as the necessary of the tractor front ballasting for avoiding too big skidding. The ballasting at the same time improves the stability on the uneven hilly lands.

Generally for every horse power of the ploughing tractor about 50 kg is needed which means in the case of 200 horse power tractor - 10 tons. On the extremely clay fields during the plough it is reasonable to blow up the tyres with water (or antigel or talc). On the black lands it is reasonable to use loading in the inner part of the rear wheels. This way it means 60 kg / horse power. If tractor skidding has been avoided there is no need to any other loading or ballast.

Follow the tractor instructions and ask for the advice from the dealer or agricultural tyres merchandiser.

5. ATTACHEMENT AND DISENGAGEMENT

5.1. THE SECURE ATTACHMENT AND DISENGAGEMENT OF THE PLOUGH



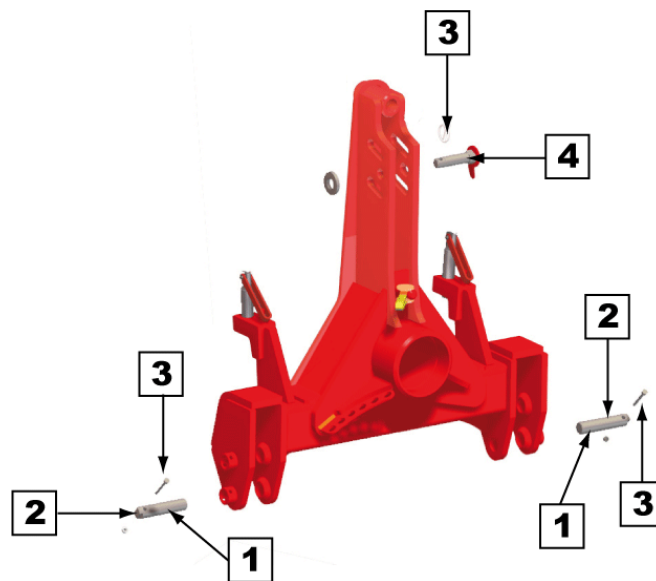
Do not let anybody to stay between the tractor and the plough when it is backing for attachment.

Before leaving the driving cabin put the gear-change into the «Parking» position, apply the hand-brake, stop the engine, take out the ignition key and put it into your pocket.

The plough must be put on the ground before disengaging. Make sure that the plough is placed on the stable plane surface.

5.2. THE PLOUGH ATTACHMENT TO THE TRACTOR

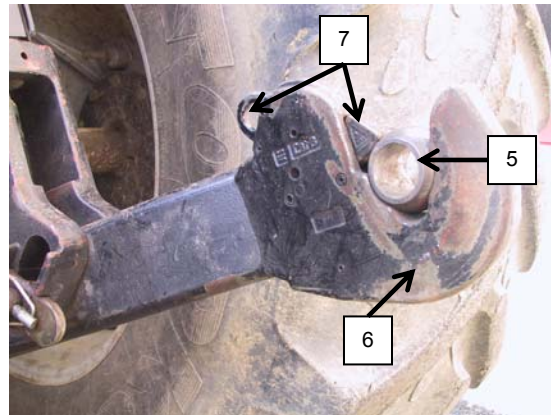
Exemple sur une tête RHAS 115



5.2.1. In the case if tractor equipped with fixed ball axle-journal bottom lifting levers

- Before every work be sure to control the plough journals and the diameter of the ball axle-journal are the same.
- Take out the plough journals (1) with the help of pulling out the security pins and bolts (2),
- Back the tractor that the holes of the bottom lifting levers be in the same line with the plough traversing rod.
- Insert to each other the pins (1) and fixing brackets (2) then fasten them with the help of security pins and bolts (3).
- If it is difficult to put the holes in one line then release the telescoping lever sas it it defined in the tractor instruction. If pins (1) are in the suitable position and fixed then start slow backing for the telescoping levers to find their place and to be fixed again. Carefully examine the connection of the equipment.
- Adjust the stabilization levers and blocks, take care of the pulling binders having the necessary size (2) in order there should be smaller lateral clearance ($\leq 1 \text{ cm} \approx 1/2''$).
- Start the attachment of the third point in such a way that the pin (4) matches the third point of the ball axle-journal and fix it with the safety pin (3). In advance examine that the diameter of the pin (4) and the third point axle-journal fit each other.

5.2.2. If the tractor equipped with the disengaging axle-journal of bottom lifting levers (quick attachment)



Quick coupling Rotule Amovible

- Take off the plough journals (1) with the help of safety pins or bolts pulling out. (2 and 3),
- Take off the disengaging axle-journals (5) from the quickly connecting cheeks (6) which are on the bottom lever of the tractor.
- The disengaging axle-journals (5) attach to the draw pins (1). Carefully examine that the diameter of the axle-journal is the same as the diameter of the pins.
- The adjustment of the pins finish with axle-journals (and attaching clamps) then fix them with safety pins (2 and 3) or bolts.
- Move back the tractor till the quick connecting cheeks of the bottom levers (6) reach the plough (equipped with axle-journals) journals.
- Raise the lifting unit till the cheeks catch the axle-journals.
- Raise the plough from the ground to 5 cm (= 2") and examine if the axle-journal fixing on the cheeks (7) is in the proper position.
- Adjust the stabilization levers and blocks whilst be sure of the attaching clamps being or proper size (2) in order that the drag lateral clearance should be the smaller ($\leq 1 \text{ cm} \approx 1/2''$).



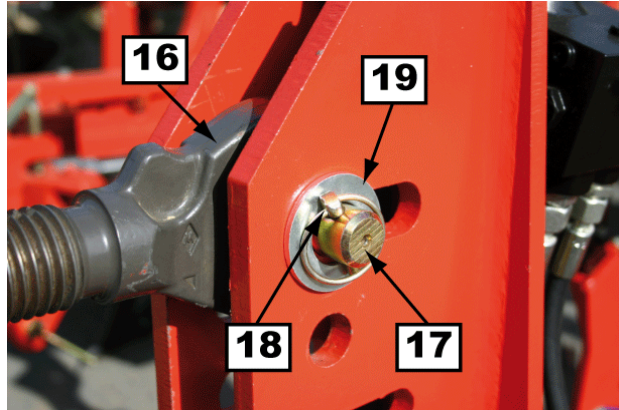
DANGER: Always examine the position of the fixing on the cheeks. If you forget about it because of wrong maneuvering the tractor may turn over and cause fatal accident.

- Start attaching of the third point.

5.2.3 Connection of the third point

The attachment of the third point start only if you are sure that the traversing is properly fixed to the tractor bottom lever.

In the chapter «Preparation of the tractor to drag» there is instruction how to adjust the third point, follow it.



- Attach the free end of the third point (16) into the binder of the traversing.
- Insert the axle (17), the underplate (19) and fix them with a safety clips (18).

DANGER: Do not try to raise or turn the plough till the third point is properly attached. The plough may turn over and cause serious injury or fatal accident.

It is possible to take the 3th point to a gap, or to a fix hole.

The gaps insure an effort control in case of lifting of lower arms of tractor. Inverse if on the tractor positioning the 3th point to fix hole it will mainly control the system.

5.2.4. The adjustment of the third point length:

In general, the adjustment of the third point length is performed to have the traversing in perfect horizontal position looking from the plough side.

But this adjustment can be still refined during the plough.

DANGER: During the third point adjusting take all necessary precautions:



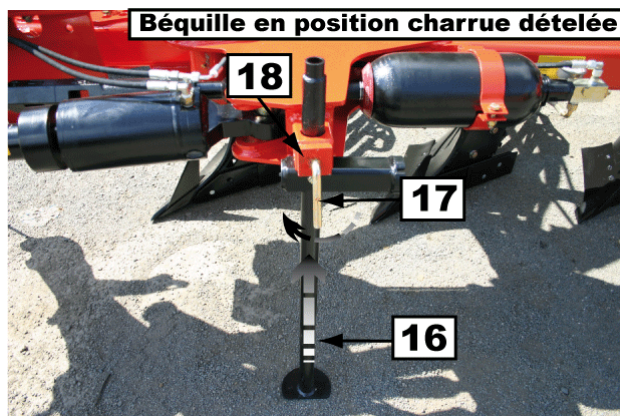
Leave sufficient length of the screw thread to avoid at the wrong time the screw thread damaging or screw loosening.

The screw jumping out of its holder may cause fatal accident.

Always put on its place the fixing element tat the tractor third point with the turning of the central female screw.

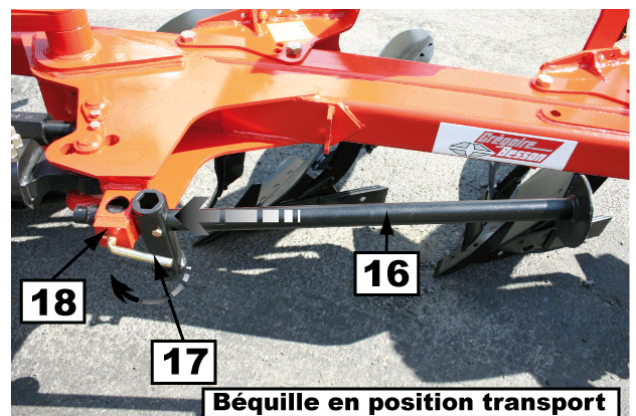
NOTICE : The big quantity of the lubricant in the inner part of the third point can prevent the shortening. Eliminate the lubricant by the dismounting of the lubricator and release the lubricants under the pressure.

5.2.5. Position de la béquille



Disengaging position

The plough have one support (16) which placed on the left side of the plough.

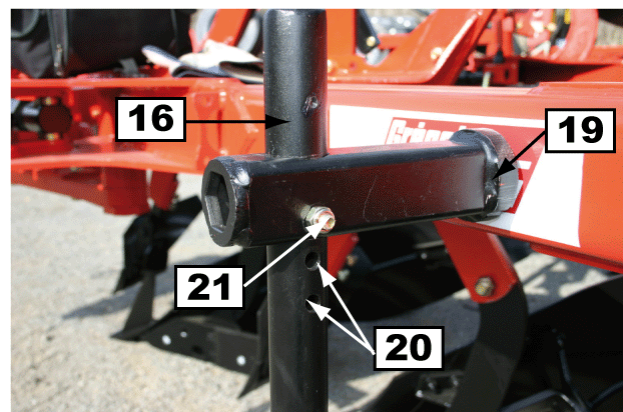


Transport position

- If attached the lower arms, the plough be easily liftable and insure to diengage the support.
- Release the bolt (17),
- Remove the support from holder (18), positioning it to transport position (horizontale).
- Tightening the bolt (17).
- Finishing the operation with attach the 3th point.

It is possible to adjust the height of support, in order to the plough connecting pions stay perfectly horizontal to connecting points of tractor.

Release the bolt (21), lower or lift the support (16). Choose one of the three hole (20) which insure the more easier dismounting of ploug.
Do not forget to replace the bolt (21).



Operation manual of plough RW 47

5.2.6. Blocking the retournement

The RW 47 plough has arrester for turning equipment. This unit can be disengaged only on the ground directly before the beginning of the plough. After the finishing of the plough the arrester again must work. With the help of it any danger of accident can be avoided because of the wrong operation which can occur during the transporting and in this way the disengaged plough motion can be prevented.



In the fixed position the axle (22) penetrates into the holder (23) which provides the fastening.

The position of the axle can be directed by a lever (24) which can be found at the front of the turning unit.

The axle must be fixed before the plough disengaging.

5.3. DISENGAGING

- Turn the plough to the quarter in order to put the plough into the transportation position (the plough should be put into the horizontal position) and then arrest the turning equipment.

Before disengaging the plough be sure that the soil surface is plane and stable to keep the plough and two brake block bases. Use wood blocks to support the plough bottoms and brake blocks in the soil is wet. Before placing the plough examine the fixation of the brake blocks.



DANGER: When the plough has been put on the ground you must put neither your hands or your feet under the brake blocks. Or under any other spare part of the plough. The getting under the plough may cause the death. Make sure that the brake blocks stay on the ground stable.

When the machine is on the ground put the hydraulic adjusting levers in the self-adjusting position to stop the pressure in the tubes and cylinders.

Stop the tractor engine, pull the hand-brake, take out the starting key and put it into your pocket.

Before disengaging the hydraulic tubes examine if they are under the pressure or not. Slowly disengage the plough and take care that there is no any connection between the tractor and the plough.

The procedure of disengagement is inverse of engagement:

- 1) Close complete the devers cylinder and/or the deport is equipped to the plough.
 - 2) Disengagement of the third point,
 - 3) Adjust the supports to storage position,
 - 4) Dismounting the lower arms of tractor.
 - 5) Disengagement of the hydraulic tubes,
- Perform all the precautions during every work.

6. HYDRAULIC CONNECTIONS

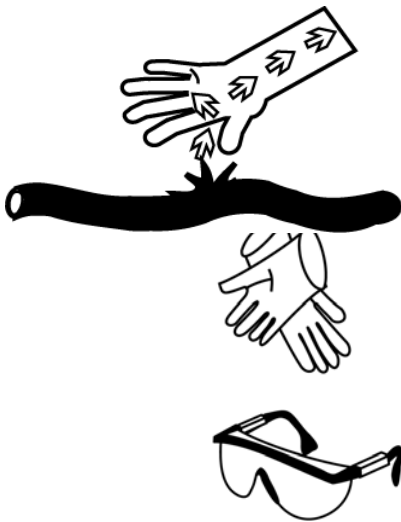
6.1. THINK ABOUT YOUR PROTECTION BEFORE STARTING THE WORK WITH HOSES AND HYDRAULIC CIRCUITS



Before you start working with pipes and hydraulic circuits always put on thick gloves and goggles.

6.2. BE ATTENTIVE WITH THE FLUIDS UNDER PRESSURE

When the fluid under the pressure flows out and penetrates under the skin or into the eyes it may cause serious injury.



- To avoid the accident or injury before connecting or disconnecting the hydraulic pipe you must eliminate the pressure. That is why after tractor stopping and putting the plough on the ground, move the distributor lever from the front to back to release the oil from the pressure.
- Before putting the hydraulic circuit under the pressure, examine if the components and connecting elements (connections, tubes, pipes) are in the adequate condition. Wear thick gloves and goggles!
- NEVER look for the leakage by your hands. Use a stick and wear thick leather gloves. For bigger security wear protective goggles. Keep the distance it does not matter what kind of leakage it is!

If the fluid under the pressure causes injury at once go to see a doctor. Any fluid which penetrated under the skin must be eliminated as it can cause gangrene which can lead to the amputation or death.. Every doctor who is not experienced in the type of injury should connect with the professional institution.

During the work keep the rear window of the driver cabin closed. The glass can give additional protection in the case of fluid leakage.

6.3. PREPARATION OF HYDRAULIC CONNECTIONS

Be sure that hydraulic connections are compatible to your tractor outputs. Incompatible connection can cause problems.

- The connectors do not stay in the tractor output or it is difficult to adjust them to each other.
- Unsuitable connections (push-pull) prevent the moving in the oil valves inducing oil overheating and/or speed reduction because of the reaction of hydraulic directive lever.



ATTENTION: Clean well the hydraulic connections as on the tractor as on the plough before joining them. If it is necessary clean down the dirt, earth and dust are the greatest enemies of hydraulic circuits. If it is necessary change the dust protection cover of the connections.

The hydraulic circuit of the plough is in advance industrially filled with oil.

Nevertheless if we have to fill oil, be sure that in the tractor case there is enough oil. Examine the oil level of the tractor hydraulic system and if it is necessary fill up it. Use only suitable hydraulic oil accordingly to the instruction of the manufacturer.

6.4. NECESSARY HYDRAULIC POWER

At the tractor hydraulic output the expected power is 160 bar minimum. The risk of this power is that the plough does not turn over.

6.5. CONNECTION OF THE FLEXIBLE HYDRAULIC PIPES

6.5.1. Connect the flexible pipes logically

Connecter les flexibles hydrauliques de façon à ce que l'opérateur puisse manœuvrer les leviers hydrauliques du poste de conduite de façon logique:

Or for example, the most often used functions put on the most accessible levers in the logic order of the operation:

Every tractor driver will connect the hydraulic flexible pipes on the base of his own experience. It is important to follow the system for directing operation to become instinctive. In the case of emergency it makes the proper reaction easier.

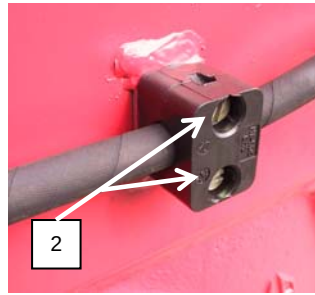
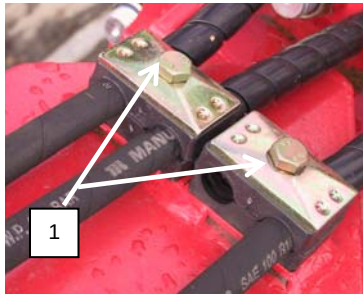


Another facility means the usage of different color collars for distinguishing of flexible pipes. Besides the color on every collar it is possible to put the sign of the connection direction + cylinder releasing, - cylinder pulling back.

These collar can be attained at the GRÉGOIRE-BESSON official dealer.

Equipments on the plough	Necessary hydraulic valves
Turning + variable work width	2 DE
Turning + dévers or déport auto + variable work width	3 DE

6.5.2. Vérifier l'état des supports de tuyaux flexibles ou rigides



The vibration during transporting or operation can cause the loosening of the fixing bolts in the fixation of the hydraulic flexible and rigid pipes (1 and 2).

Systematically view and examine that the bolts belonging to the hydraulic pipes (1 and 2) must be fastened properly.

6.5.3. Examination of the flexible pipes length

Take care that the flexible pipes do not interfere with tractor or plough parts. Think over in advance what length of the pipes is necessary for such maneuvering as going at abrupt bends or the plough putting up and down.

If it is necessary make flexible pipes shorter or longer. The necessary implements you can find at the GRÉGOIRE-BESSON dealers.

If the flexible pipes get damaged then they will not operate accordingly and become dangerous. Systematically examine the hydraulic circuit condition. Change the damaged or worn pipes.

6.5.4 Examination of the hydraulic connection tightening of the supplementary plough bottom

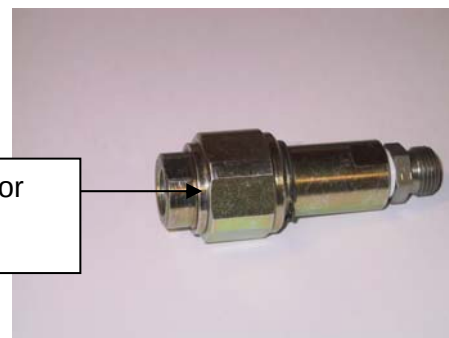
IMPORTANT: The hydraulic connection securities must be screwed till the end for the supplementary plough bottom locking proper operation. The sleeve of the connector should hit the suitable part of the bottom of the connection.



Connector

Connector bottom

Connector sleeve



If the connector is not fixed properly it causes damage to the supplementary plough bottoms because during the coming over obstacle the hydraulic oil cannot flow to the hydraulic accumulator.

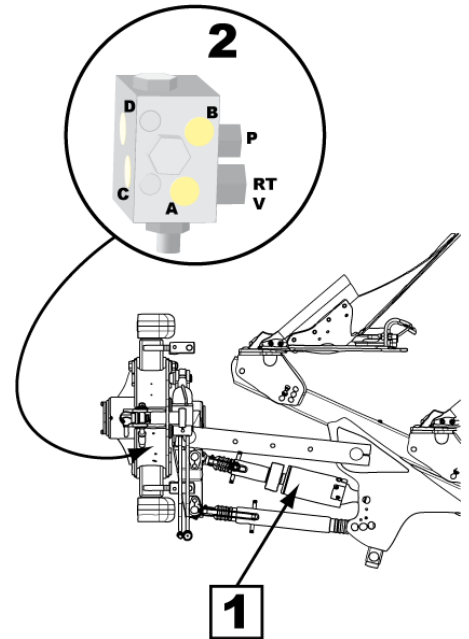
6.6. BRAS DE DÉPORT HYDRAULIQUE.

6.6.1. PRINCIPE.

The mechanical deport arm possible replace with hydraulic deport arm (1). It accessories insure contionus operation for plough.

The hydraulic deport arm connect with automatic control box (2), which insure the automatic closing and opening of plough at time of turning, necessary the next conditions:

- Working width (18", 20").
- Six or five socks.
- Tractor equipped with double action control valve.



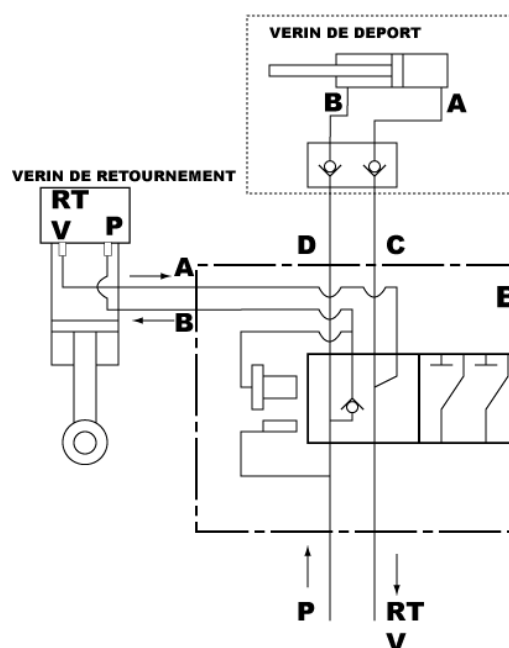
6.6.2. CONNECTION OF HYDRAULIC ARM WITHOUT AUTOMATIC CONTROL

Connect the flexibile hoses of deport to double effect control valve of tractor.

6.6.3. CONNECTION OF HYDRAULIC DEPORT ARM WITH AUTOMATIC CONTROL

Connect the hoses on the basis of example:

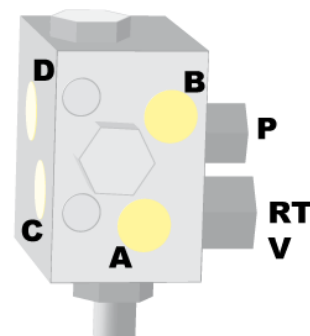
- The hoses of deport hydraulic arm cylinder to automatic control box (C & D).
- The hoses of retourment hydraulic cilinder to automatic control box (A & B).
- The hoses of automatic control box to double effect control valve of tractor (P & V).



SCHEMA DE PRINCIPE

en une seule action sur la commande

1. recentrage par le deport
2. rentrée du vérin de retournement
3. sortie du vérin de retournement
4. ouverture du bras de deport



6.7. DEVERS HYDRAULIC ARM

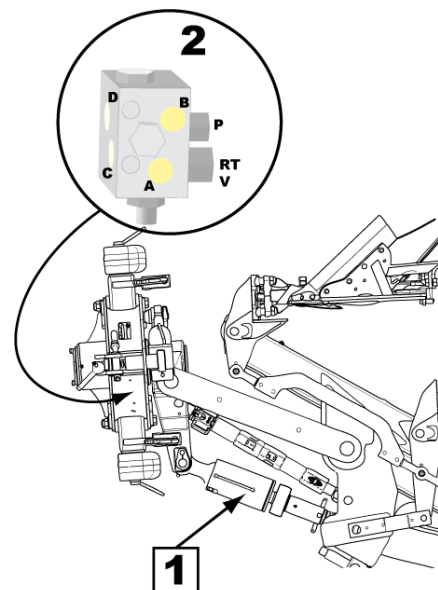
6.7.1. PRINCIPLE

The mechanical devers arm possible to change to hydraulic arm with automatic control box.

The unit make a possibilities to adjust the plough back after the turning.

For operation necessary the next conditions:

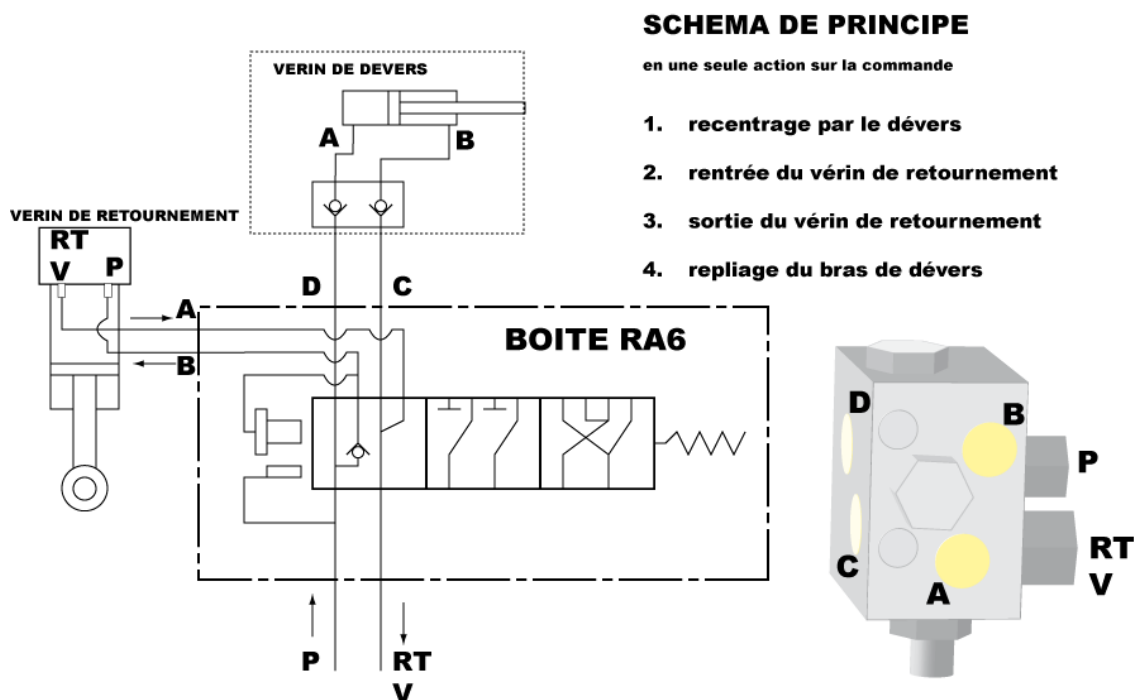
- large working width.
- Usage of lateral wheels.
- Six or five socks.



6.7.2. CONNECTION OF HYDRAULIC DEVERS ARM WITH AUTOMATIC CONTROL

Connect the hoses on the basis of example.

- The hoses of devers hydraulic arm cylinder to automatic control box (C & D).
- The hoses of retourment hydraulic cilinder to automatic control box (A & B).
- The hoses of automatic control box to double effect control valve of tractor (P & V).



6.8. MEMORY CYLINDER FOR VARIABLE WIDTH

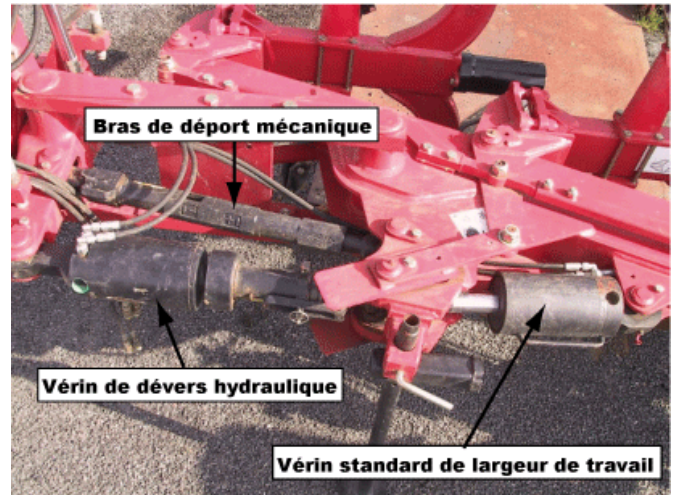
6.8.1. PRINCIPLE

The memory cylinder insure the recentering of variable width plough at time of turning. The plough close itself to 12", turning and after it automatically adjust the previously selected working width. If necessary the working width adjustable plus and minus from the tractor seat.

6.8.2. ASSEMBLE OF CYLINDER

The plough may equipped with standard working width adjuster cylinder and in this case with hydraulic devers cylinder.

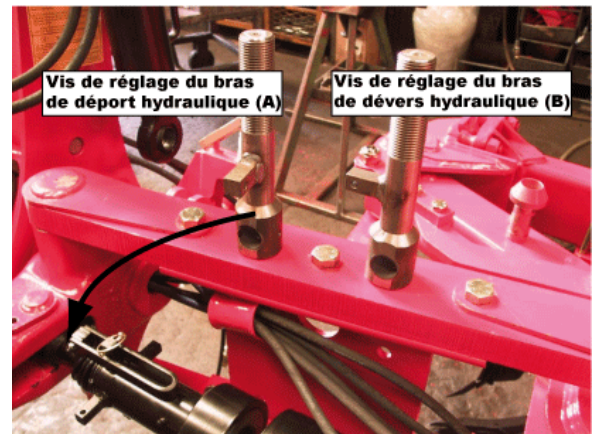
The assemble consist the installation of an memory cylinder, which adjust the working width and recenter the plough meantime of turning. After it change the devers cylinder and the mechanical deport arm. It is true more useful to recenter the plough with devers. The adjustment of devers is an adjustment, which often modify in time of work, contrast with deport, how install the cylinder which operated the system.



A. Determine the difficult pieces which see at memory cylinder.

B. Remove the devers cylinder from the ploug, the two axle and the flexible hydraulic hoses. The cylinder will occupy the place of arm of deport mechanic, remove the adjuster (B) from cylinder and install the adjuster (A).

C. After it remove the standard cylinder of variable width adjuster, with flexible hoses.

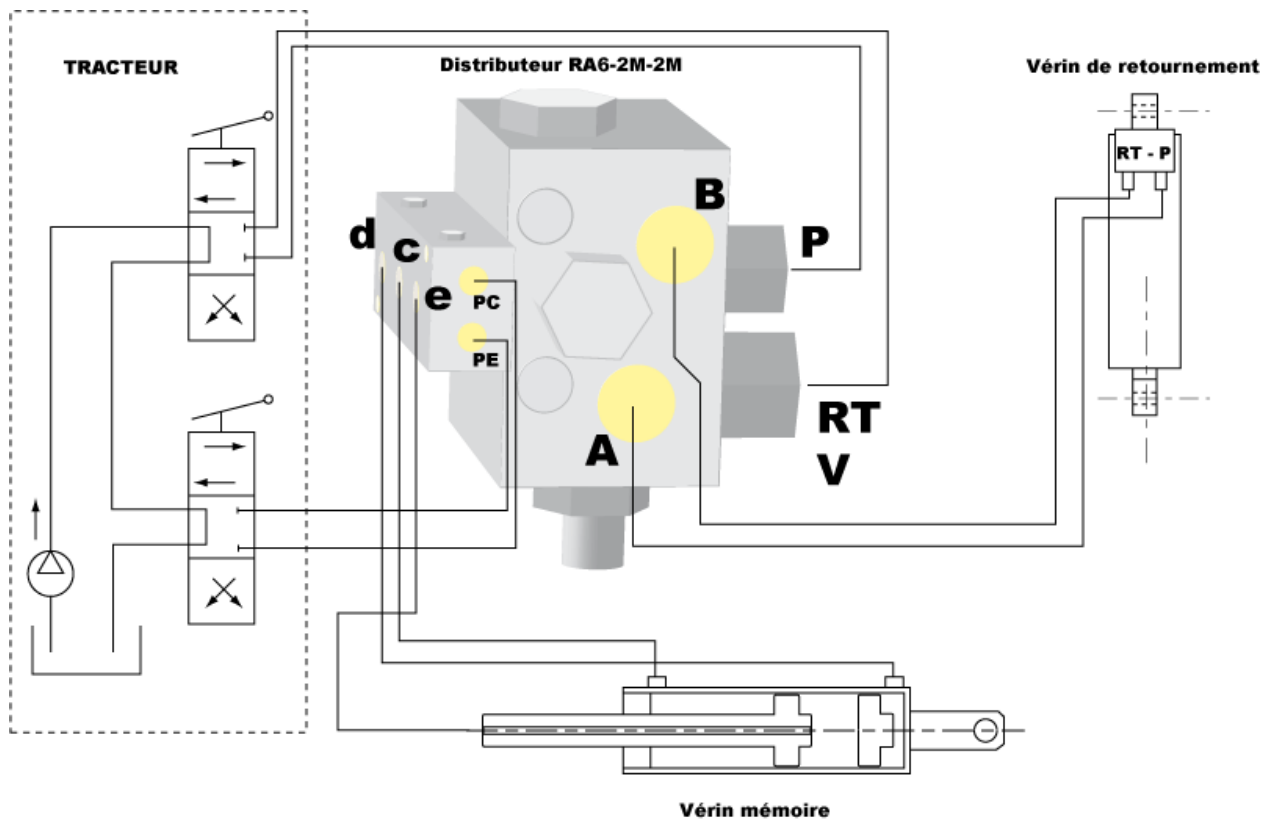


D. Replace the mechanical arm of deport to original place of hydraulic devers arm. Pay attention to retain the same place of axels and the rings.

E. Install the memorycylinder of control variable width.

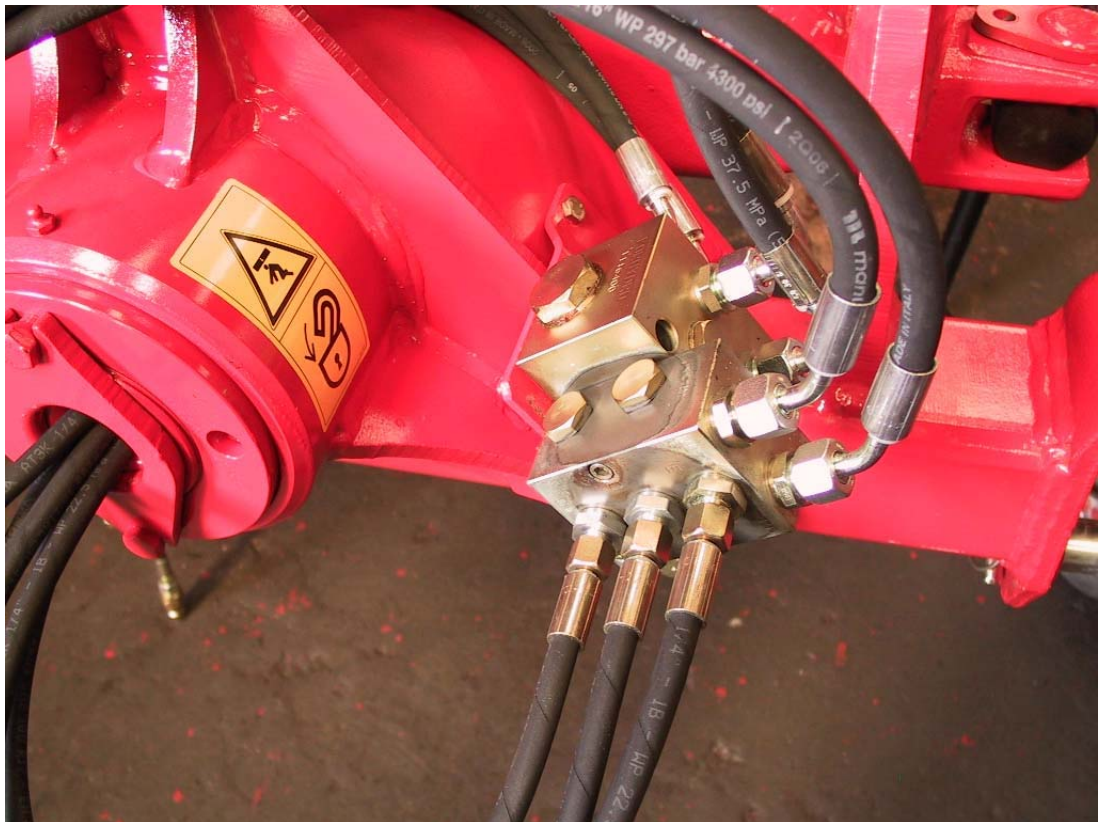
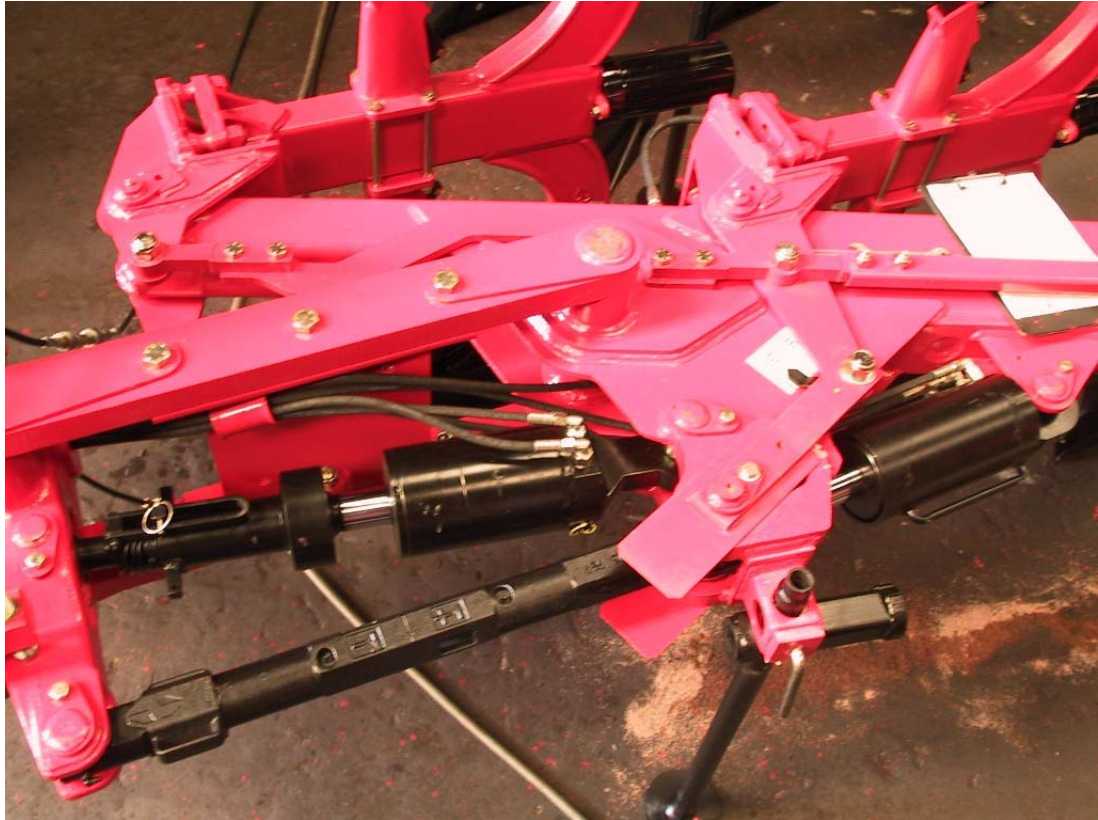
F. At end install the mechanical devers arm (to original place of deport arm).

G. Change and replace the new control box and fit the flexible hoses found of next figure.



The plough ready to operation.

Photo of new accessories.



7. PREPARATION OF THE PLOUGH BEFORE THE OPERATION

After attaching the plough to the tractor follow the next examination for the easy adjustment. Belonging here maintenance work you can find in the chapter „Maintenance and lubrication”.

7.1. PRESSION DES PNEUS DE LA CHARRUE

Check weekly the pressure of tyres. Do not allow decrease the pressure of tyres under the minimal value.

Wheel size	Recommended pressure	Min. pressure	Max. pressure	Max. speed
600 X 9	4 bar	3.5 bar	5 bar	25 km/h 15 mph
200 x 14.5	5 bar	5 bar	7 bar	25 km/h 15 mph
10.0 / 75 -12	3.5 bar	3 bar	3.9 bar	25 km/h 15 mph
26 x 12.0 -12	2 bar	2 bar	2.7 bar	25 km/h 15 mph
10.0 / 75-15.3	5 bar	3.2 bar	5 bar	25 km/h 15 mph
13.0 / 55-16	2.5 bar	2.2 bar	4 bar	25 km/h 15 mph

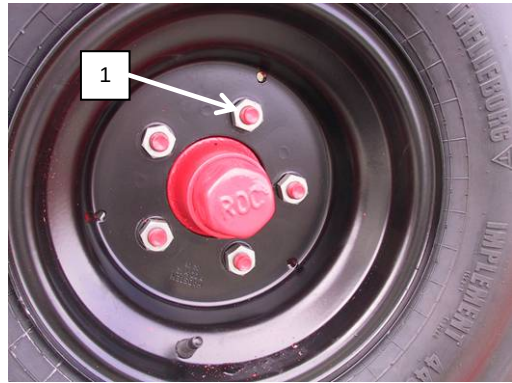
Carefully check the industrial values which are engraved on the tyres side. If the data in the table and on the tyres side are different, you should take into the consideration the last ones.

The over blown transporting wheel can be punctured.

In the case of wrong blowing up, the tyre can jump off the wheel or the plough will be unstable during the transporting.

Do not drive if there is very low pressure in the wheels or some cutting or some bulge on the rim, or they are rusted, damaged or some wheel bolts are missed.

7.2. CHECK THE WHEELS BOLT FASTENING



Every day you must check the wheels and tyres if the bolts are properly fastened (1).

WARNING

- Adhesive clawed tyres require more attention than traditional wheels (ribbed profile). The adhesive clawed wheel provide good adhesion on the ground but on the roads they cause vibration. Because of that wheel bolts can be easily loosened.
- Before starting you must always check the fixation of the bolts and if it is needed to fasten them.

7.3. ADJUSTING OF DEVERS ARM

7.3.1. PRINCIPLE

Before travel to fields, it is necessary to prepare the adjustment of devers arm, see it in further. The adjustment depend of work, not only assamble it.

The devers arm adjust the plough to center position, it means that the third point must to positioning to direction axle of tractor.

The minimal and maximal distance between mechanical and hydraulical devers arms axles:

Mechanical:	minimum = 782mm	maximum = 882mm
Hydraulical:	minimum = 766mm	maximum = 816mm (travel of cylinder = 60mm)

Faire un pré réglage du bras de dévers suivant l'entre corps :

Between socks 900 : 800 mm between axes.

Between socks 1000 : 812 mm between axes.

7.4. ADJUSTING OF MECHANICAL AND HYDRAULICAL DEPORT ARM

7.4.1. PRINCIPLE.

The width of first course adjustable by the deport arm and moreover correct the last course width to previously course.

From the setting of deport arm depend the position of socks to tractor wheels and with it adjustable the working width.

The minimal and maximal distance between mechanical and hydraulic devers arms axles:

Mechanical: minimum = 782mm maximum = 882mm

Hydraulic: minimum = 766mm maximum = 816mm (travel of cylinder = 60mm)

7.4.2. ADJUSTING THE LENGHT OF MECHANICAL DEPORT ARM

Mesure the distance (Y) between the tractor wheels.

Adjust the distance (between axles) of deport arm to value reading in next tables, corresponding to wheel distance and sock distance.

DISTANCE-STOCK 900

Tyres	Deport arm
1m20	839 mm
1m30	832 mm
1m40	824 mm
1m50	816 mm
1m60	808 mm
1m70	800 mm

DISTANCE-STOCK 1000

Tyres	Deport arm
1m20	845 mm
1m30	837 mm
1m40	830 mm
1m50	822 mm
1m60	814 mm
1m70	597 mm

7.4.3. ADJUSTING THE LENGHT OF HYDRAULICAL DEPORT ARM

When the plough fitted with **hydraulic deport arm**, and modifying the distance between axles, it is fault, check the power of arm with opening and closing totally without push the chassis or the devers arm.

1. Open fully the cylinder of deport arm.
2. Adjust the lenght (axles distance) of hydraulic deport arm hydraulique corresponding to next table.

	Lenght of deport arm	Min. tyre distance	Max. tyre distance
Distance-sock 900	840 mm	1m20	1m60
Distance-sock 1000	847 mm		

It is possible to correcting the initial setting of deport arm plus or minus 5mm.

7.5. PRÉPARER LES CORPS NEUFS AVANT LABOUR

The Grégoire-Besson ploughs are protected against rust before they leave the plant. They are not able to perform correct operation till the protective paint is abraded because of the chafing to the ground.

The black paint (or clear lacquer) will be chafed in some hectares. But if there is soil which does not have any chafing affect (peat, clay, sludge), it would be better if you rub off the paint before starting to plough. It may happen that ground adhere to the moulboard and it does not slide. For this purpose apply paint stripper. If it is necessary use stronger material for taking of the paint.



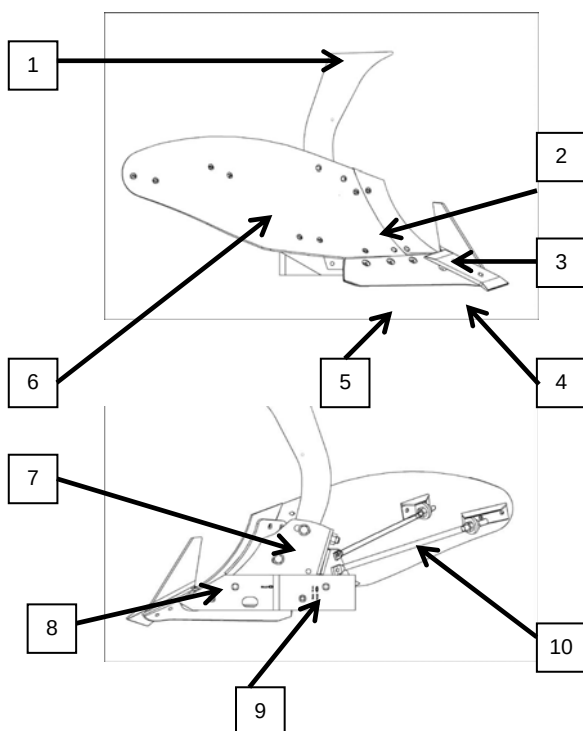
ATTENTION: During the work pay attention to the proper airing if you apply paint stripper to the moulboard.

Wear **goggles** and protective **gloves**.

Pay attention to the direction of the wind.

NB : On the first day to operate the plough easier helps the dismounting of the chisel nose which can make penetration into the soil quickly especially to the heavy soil.

7.6. APPRENDRE À NOMMER LES PIÈCES DE LA CHARRUE

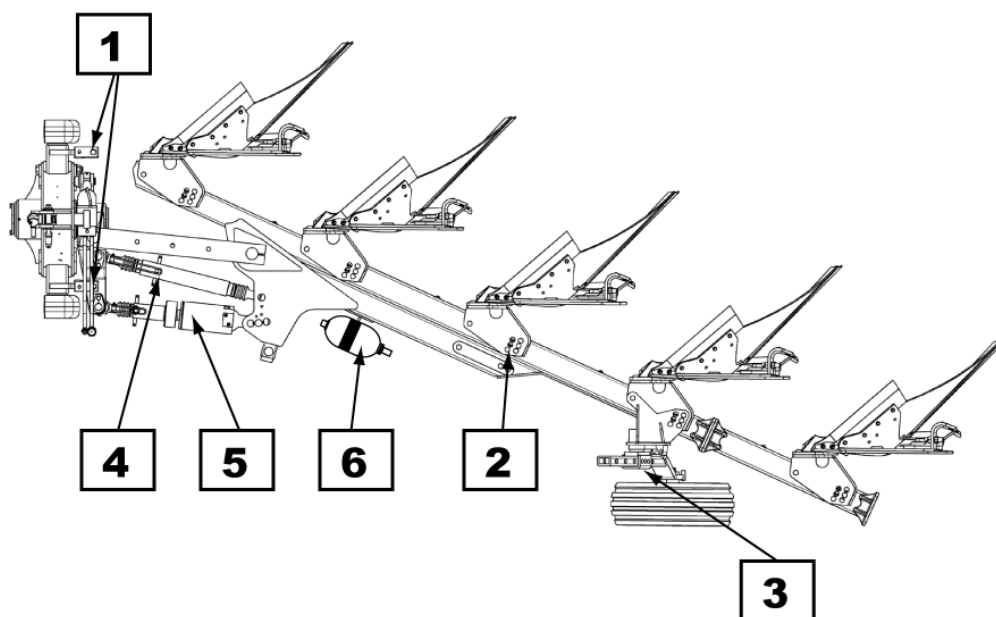


1. Age (également appelé étançon)
2. Plough nose
3. Underground coulter pinion (option)
4. Reversible chisel end
5. Blade (sock)
6. Moulboard
7. Skate *
8. Reversing plough sole
9. Plough sole tightening
10. Moulboard adjuster

* The skate is the spare part on which abrasive elements are screwed up.

The model on the figure : TA plough bottom and H8 – right moulboard

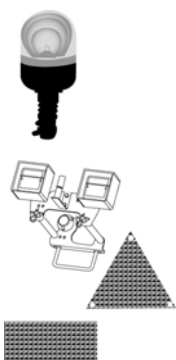
7.7. VIEW OF THE PLOUGH ADJUSTING MECHANISMS AND THE CHECK OF OPERATION



- 1 Adjusting the inclination of plough.
- 2 Adjusting the working width of all socks.
- 3 Adjust the lateral height of wheel (example).
- 4 adjust the deport (working width of first sock).
- 5 Adjust the devers (orientation of plough).
- 6 adjust the pressure of hydraulic safety system (option).

For attaining the optimal power capacity of the wheel and for quick adjusting on the fields get to know the place of the plough adjusters. Be sure of the adjusting screws or bolts or elements and their suitable operation. If it is necessary lubricate them. These checking tasks are easier to fulfill in the machine-shop than in the field.

7.8. CHECK THE LIGHTS AND SIGNALIZATION



- Examine that accordingly to the local laws and rules reflectors and lights are operating and clean and can be well seen by other drivers.
- Use the reflectors, flashing and signalization day and night.
- Security equipment keep in good condition. Clean them from dust, dirt and residues.
- Change missed or repair damaged signals.

Signalization kit and additional parts can be got at the GRÉGOIRE-BESSON dealers.

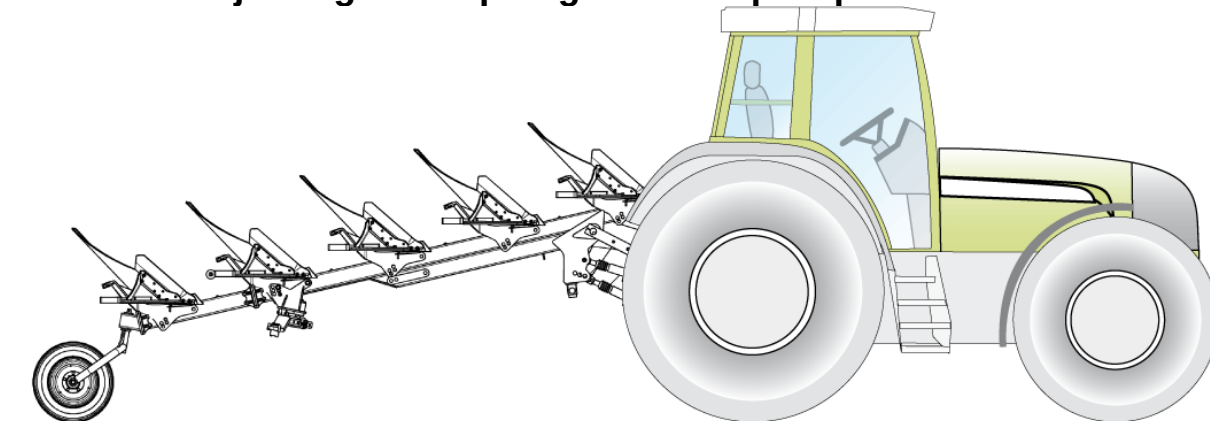


IMPORTANT: You are responsible to keep the rules and laws of the given country and to provide your machine with all needed signals and equipment.

8. TRANSPORT

8.1. BEFORE TRANSPORTING

8.1.1. The adjusting of the plough to transport position:



In the transport position the mouldboards are placed horizontally.

8.1.2. Before using the plough on the public roads

Before going onto the public road:

- Put the plough into the transporting position in accordance to the instruction,
- Pay attention that required lights and signals are properly mounted, they must be clean and work well (lights, reflectors, etc.)

Keep Highway Code rules on the public roads:

- Do not overcome the allowed maximum width or length. If it is bigger than the maximum size follow the rules for special transporting (escort, special tables and signs, authority permission).
- Keep the maximum axle loading and tractor and freight allowed maximum weight. Be sure that the loading of the first tractor axle is never lower than the tractor mass 20 % . If it is necessary put some ballast on the front part of the tractor.

Operation manual of plough RW 47

8.1.3 Verrouillage / Déverrouillage du retournement au transport

In order to avoid any accident the plough has been mounted with reverse blocking device. With the help of it the wrong operations during transporting can be avoided.

Because of the blocking device the plough can not turn over in the case of hydraulic pipe or unit disruption.

The movement of turning blockage axle (22) relatively easy. Regularly check the slipping of axle. If necessary lubricate it (with grease or oil). Check the appropriate operation of spring, which allow the automatic re-engage of blockage at time to set to transport position.

La charrue est posée au sol en position travail (les corps à la verticale). Pour verrouiller la charrue au transport :

1. Lift the plough to trigger to high, than lift the tractor,
2. Block the axle (22) with help of handle. The position of axle command with handle (24), positioning in front of turning mechanism house.
3. Turn the plough, with help of turning lever, one quarter of turn.
4. The plough will blocking automatically. In this blocked position the axle (22) enter to sleeve (23) and make a blockage.
5. Check the blockage before remove the plough.
6. Disconnect the 3th point.



Operation manual of plough RW 47

8.1.4. During transport put the plough centre of gravity lower

In order to reduce the tractor lifting lever unnecessary overloading during the transport we must do everything to put the plough center of gravity lower.

For this purpose perform the following:

- Disengage tractor hydraulic lifting device,
- Again close the hydraulic adjuster of the first furrow,



If the plough is ready for transporting it is recommended from the cabin to block hydraulic adjusting levers. By this any operation performed in unsuitable time can be avoided.

N.B.: Do not forget to perform suitable hydraulic adjustment if again you want to work.

8.2. DRIVING ON THE ROADS

Switch on the lights, different signals and flashings (following the rules).

ATTENTION:



- Check if there is any interference between the tractor and plough.
- Check if the plough accordingly has been fastened for transporting, if the reversing device and articulation have been blocked, if tractor distributors are closed.
- Do not drive faster than 25 km/h (15 mph). Choose reasonable speed not to lose control over the traction.
- On the roads the tractor pulling the plough should be the same size, mass and power as during the ploughing.
 - Slow down at the bends and uneven roads.
 - Do not use the brakes whilst turning abruptly.
 - Because of vibration the wheels screws and bolts can be loosened.
 - Always check their tightening before going on the road.
 - If you are driving on the roads follow the Highway Code rules of the given country.
 - Show calm and polite behavior with other drivers.



IMPORTANT: You are responsible to keep the law of the given country and your machine must be mounted with good signal equipment and be maintained.

9. FIELD SETTINGS

9.1. BE PRUDENT ON THE FIELD

Totally follow the present instructions of the 2 chapter which contains the security rules and the behavior on the fields.



- Systematically check if the plough properly attached to the tractor 3 point linkage (pins should be in suitable condition and the presence of the security clips or safety bolts of fastening equipment)
- Always be sure during the maneuvering that there is nobody near the tractor.
- It is dangerous to be jammed between the plough and the tractor during any interference that is why before stopping the engine, put the lifting device into the low position.
- To the persons in your environment point the safety zone.
- Never stay near non-stop securities or any other element under the pressure or which can be reversed.
- Be sure that there is enough place to perform maneuvering without any danger.
- Reduce engine revolution and speed turning at the end of the field..
- Never try to adjust, clean or lubricate the plough during motion.
- Be careful of any dangerous injury or getting nipped.
- For the performing of any adjustment use the proper implements.
- Wear suitable protective clothes.
- Do not get on the machine during the moving.
- Do not let anybody to get on the machine..

9.2. ADJUSTMENT OF THE WORKING POSITION



If you are in the field the plough can be put into the working position:

- The hydraulic control levers of the switchboard put into the natural position,
- **Using the lever release the reversing blocking cylinder: make sure, that the wheel isn't on the ground.**
- At the beginning place the tractor and the plough on the left or right edge of the field.
- With the help of reversing hydraulic controlling tilt the plough on the needed side to be prepared to plough.

9.3. CHOICE OF THE PLOUGH DIRECTION

In order for some years to get totally smooth surface of the field it is recommended every years to start plough on the other side of the field, in even year start on the right side, in odd year start on the left side.

9.4. ADJUSTING ON THE FIELD

Before starting plough perform the adjustments described in the chapter. It is very important to read the chapter till the end before starting plough.

For optional plough often it is necessary to do plough there and back several times. The adjustment should be adapted to the conditions.

IMPORTANT : The change of one given adjustment can be followed by the change of another parameter. It is important to analyze and understand the reasons of the given problem and see the consequents. In the sake of the goal it is recommended to perform only one changing and if there is no result it will be easier to turn back to the beginning.

IMPORTANT : For understanding better different adjustment you should read this chapter carefully, before you start the plough.

9.5. PREMIER PASSAGE

The first course should be treated in other way. As during the first course the tractor can not go in the furrow. The adjustment can be a little bit changed, it may be the depth of the front part of the plough.

9.5.1. PUTTING THE PLOUGH ON THE GROUND

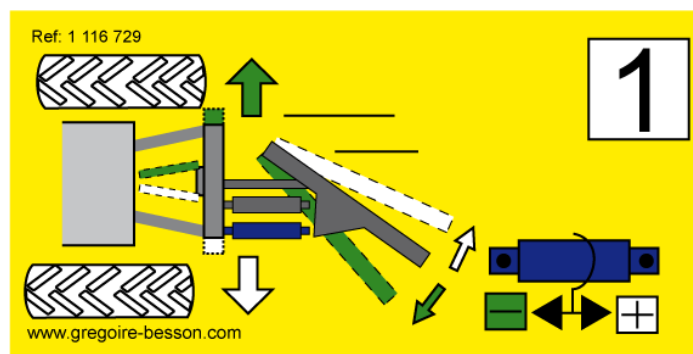
At the beginning of the ploughing, when the movement has been started, put the plough slowly on the ground in order to plough penetrate into the soil gently and evenly.

9.5.2. ADJUSTMENT OF THE DEVERS

The first adjustment of plough determinate the working working area. In the first step promise free travel for tractor stabilizers (2 to 5 cm free travel).

Adjust the plough shares to paralell with tractor advancing direction. On 3th point of tractor put a signal for adjusting of devers. En effet il faut chercher a le positionner dans l'axe du tracteur en jouant sur le réglage du dévers.

There is a matrice on the devers arm of plough: it helps to understand the correct way of adjustmet.



If the third point susceptible to **move to working direction** (green colour) must to shortening the devers arm, because in this case the plough come back to line of advancing of the tractor.

If the third point susceptible to **move to non working direction** (white colour) must to enlarge the devers arm, because in this case the plough come back to line of advancing of the tractor.

9.5.3. ADJUSTING OF THE WORKING WIDTH

The working width of each sock of RW 47 plough adjustable between 12" and 20" or between 14" and 22" depending of distance between socks.

The adjustment performable from cabin by hydraulic control lever of distributor in on way across hydraulic tank either simple way direct. In time of turning the plough working width will adjusted automatically to previous value with equipped memorie cylinder.

An arrow shows the working width on scaled table, in inch shows the width of each socks.

For any modification of working width change the position of first sock (deport) and modify the position of deport by cylinder.



9.5.4. ADJUSTMENT OF THE WORKING DEPTH

For adjustment of the working depth it is necessary to have two positions of the devices:

- | | |
|---|--------------------------|
| 1 – The height of tractors hydraulic lifting system | For first part os plough |
| 2 – The adjustment of ploughs wheel | For rear part of plough |

9.5.3.1. The adjusting of the depth with the tractor lifting device height

The tractor lifting device height is adjusted by the lifting lever on the switchboard.

At the first course the front sock can not put the ground into the furrow, at it does not exist yet. So it is natural that the lifting device of the tractor should be raised a little to avoid the formation of the very big ground piling performed by the front plough bottom.

9.5.3.2. Adjustment of the tractor control system (Draft-Control)

At first it is recommended to put draft control to minimum sensibility (0 - 1), this way it will be easier to control and adjust it later. When the suitable adjustment is performed it will be enough to increase the sensibility of the draft control to optimize tractor adherence.

NOTICE:

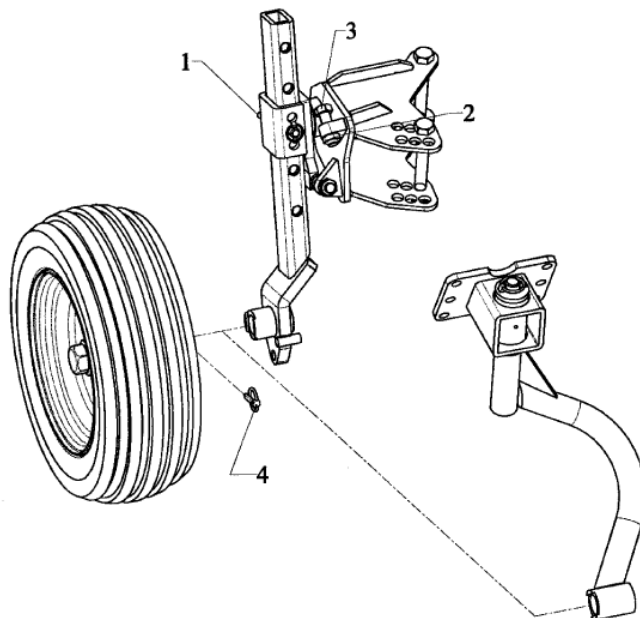
- In some definite cases, when there are unfavorable draft conditions (soft, wet soil, limited draft power), it is impossible to put to the minimum the draft sensibility. In this case take into the consideration the expected reaction of the lifting device performing the average depth.

9.5.4.3. Adjusting of working depth by wheel.

9.5.4.3.1 Wheel of land and transport «RJL».

a) POSITION AT FIELD

1. Remove the pin (1) and select a request position for the arm and land wheel, reassemble the pin.
2. Release the counter-nut (2) and finished the adjustment the land wheel with turn the screw (3) to clockwise or anticlockwise.
3. Tighten the counter-nut (2).
4. After operation make this operation inversely.



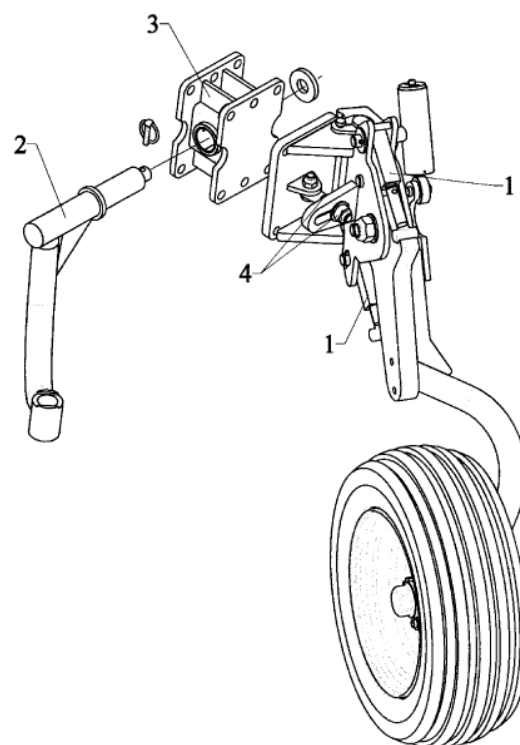
b) POSITION AT TRANSPORT

5. Remove the lynch pin (4) and transfer the wheel from the land arm to the transport arm.
6. Reassemble the lynch pin (4) to wheel hub and adjust the plugh to transport position.

9.5.4.3.2 Furrow wheel «RJR».

a) POSITION AT FIELD

1. For adjusting of depth of work, turn the adjusting rod to clockwise or anticlockwise (1).
2. For orientation of wheel release the nuts (4), positioning the wheel paralell to socks and tightening the nuts.



b) POSITION AT TRANSPORT

3. Assemble the transport arm (2) to the intermediate support (3).
4. Remove the lynch pin and put the wheel from land position to transport position.
5. Adjust the plugh to transport position.

Operation manual of plough RW 47

9.5.4.3.3 Lateral double wheel «DRL20».

a) POSITION AT FIELD

The DRL20 is a fix and at lateral position. In working position the DRL20 offer you a lateral position wheel which automatically align to each side from 12" to 20".
The adjustment of the lateral double wheel unit the following:

1. Positioning the depth limiter (4) which fit into the hinged support of shock-absorbers (3),
2. Insert the lynch-pin which blocking the movement of limiter,
3. Set the plough to working position to right or left,
4. Put the double wheels to working position with carry out ¼ turn,
5. After it positioning the directing pin (5) while the pin will be correspond to slot and allow to carry out the orientation automatically.

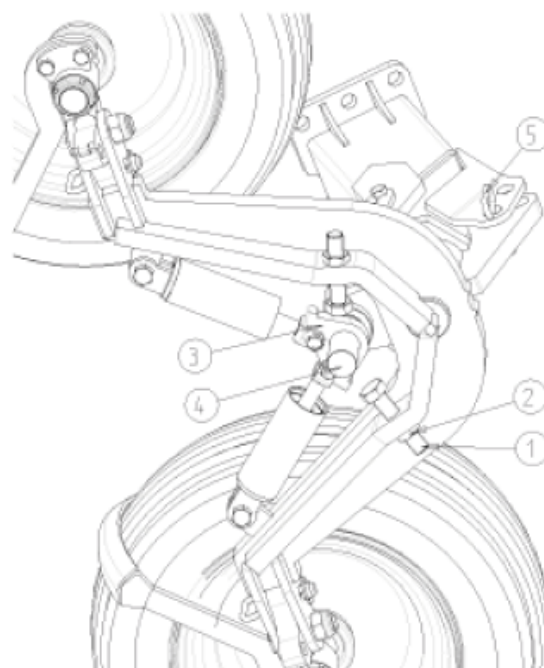
b) POSITION AT TRANSPORT

The maximum driving speed never exceed 25 km/h.

The DRL20 offer for you an stabile unit which contain two wheels and the manouver to set to the transport position is simple and quick. Fot the transport it is very important, to block the lifting arms of the tractor.

The methot to set the plough to transport position is a following.

6. Positioning the directing pin (5) while correspond to hole and block the directing unit.
7. Put the double wheels to transport position with carry out ¼ turn, the direction of turn is inverse of working direction,
8. Set the plough to working position to right or left,
9. Positioning the depth limiter (4) which fit into the hinged support of shock-absorbers (3),
10. Insert the lynch-pin which blocking the movement of limiter,

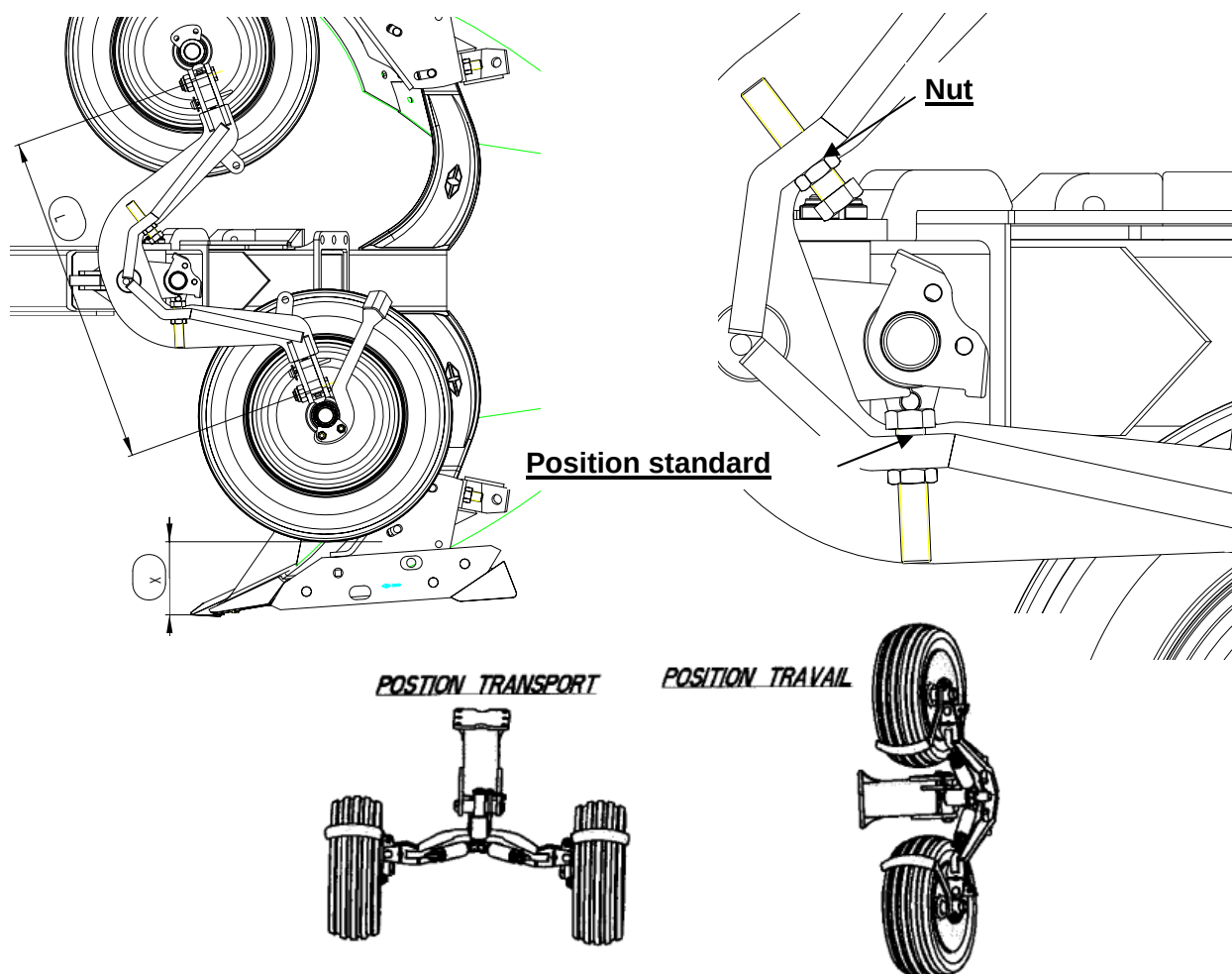


c) ADJUSTING OF THE WORKING WIDTH

11. For adjusting the working depth loosen the counter nut (2) and turn the screw clockwise or anticlockwise (1). When finished the adjustment tighten the counter nut (2) to avoid the move the adjustment.
12. The adjustment is same on opposite side.
13. The table show the teoretical depth values (without sinking of wheel) The min. and max. value X regard to wheel DRL20, next the height between – points of the plough, the type of wheel support (little, middle, large) ad the type of wheel (200/60x14.5 or 10-75x12).

Operation manual of plough RW 47

Hauteur charrue	1m60				1m70				1m80			
roues	200/60x14.5		10-75x12		200/60x14.5		10-75x12		200/60x14.5		10-75x12	
Support 199047 (little, L=710mm) Position Standard	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	maxi
	116	335	81	300	166	385	131	350	<u>NON UTILISE</u>			
Nut distance	65		30		115		80					
Support 199048 (middle, L=810mm) Position Standard	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	maxi
	53	295	18	260	103	345	68	310	153	395	118	360
Nut distance	21		0		71		36		121		86	
Support 199049 (large, L=910mm) Position Standard	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	Maxi	Mini	maxi
	<u>NON UTILISE</u>				53	304	18	269	103	354	68	319
Nut distance					21		0		71			



9.5.5. ADJUSTING OF INCLAMINATION

Lack of furrow in first course the inclamination of plough isn't permanent, because the four wheel of tractor are horizontal, they are on even ground.

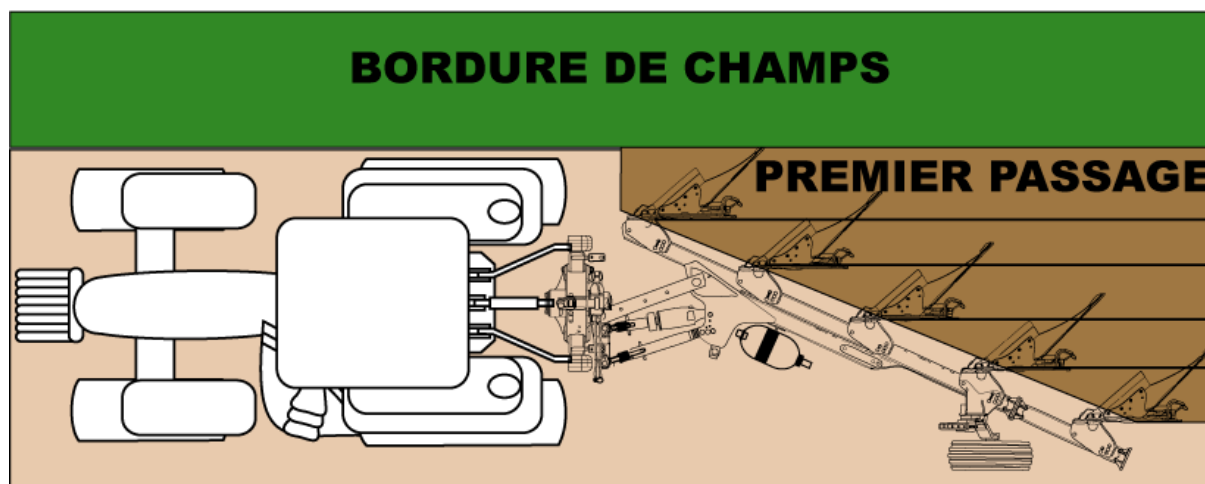
But the adjusting of inclamination may be useful in first course too.

See the adjusting of inclamination in chapter 9.6.2.

9.5.6. HYDRAULICAL ADJUSTMENT OF 1th COURSE (deport)

At the first course it is often advantageous it here is the maximum lateral displacement/deport in the direction of the external side. By this it can be avoided to go too close to the edge of the forest or ditch.

This adjustment aviable only on ploughs which fitted with hydraulic cylinder and kontroll the position of first furrow.



9.6. SECOND COURSE

Before the final adjustment:

Make sure, that after some hours operation the mouldboards polished suitably. For soil must to pass trough without any sticking.

Sometimes on peatly or claily soils it possible, that the soil stick to metal in further too. Besides such conditions – as often as possible – clear the mouldboards, entirely the soil pass trough without sticking. See in chapter 7.5 in this Manual (Preparing the new mouldboards to operation). Such extreme conditions may be required plastic mouldboards. Consult your GRÉGOIRE-BESSON dealer who can help you the choice of the best technical solution.

9.6.1. CORRECTION OF DEVERS

When begin the second course it is necessary to check the adjustment of plough, the connection between other adjustmnet in driving direction.

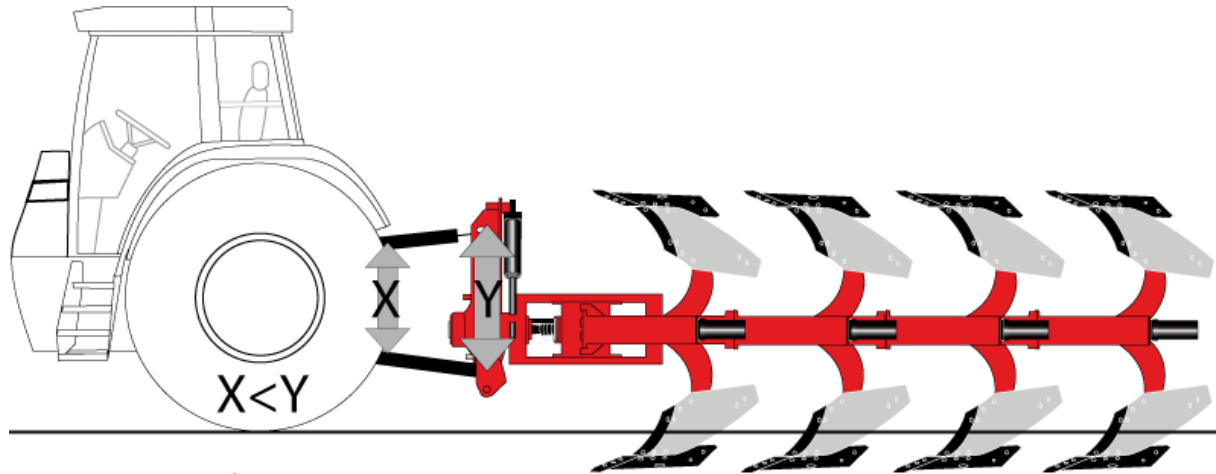
Operation manual of plough RW 47

9.6.2. Vertical position of plough

In the second course the wheels of the tractor are going in the furrow.

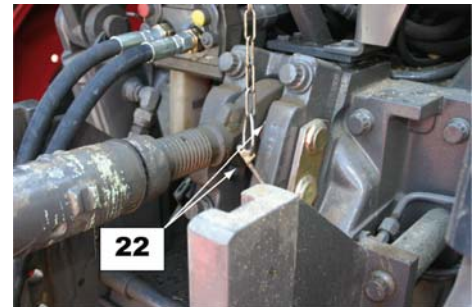
For good ploughing the side part of the plough (inclination from left to right) as well as in longitudinal should be on the same level (from front to back).

9.6.2.1. Adjustment of the 3th point



The position of 3th point must to adjust, when the tractor is in course (second course) and the plough is in the soil. In work, the 3th point at the side of plough always higher, generally 1 hole over horizontal ($X < Y$).

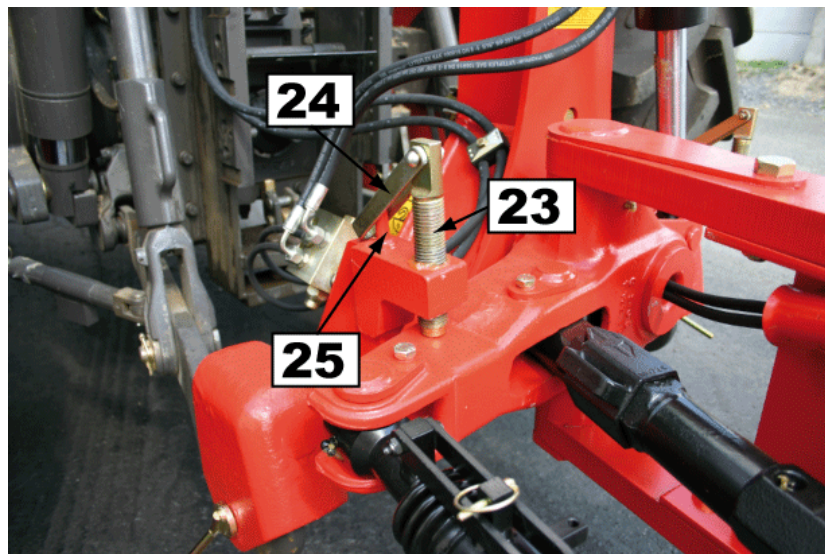
At the tractor side the height changeable on the support of arm (22). At the plough side, the height changeable by use of different potential holes to connection the 3th point.



CONNECT THE 3th POINT AS FAR AS POSSIBLE IN CENTRE

Operation manual of plough RW 47

9.6.2.2. Adjusting the inclination (horizontal position = vertical)



The adjusting screw (23) of plough to be found under the turning cylinder. There are 2 screws, one per side.

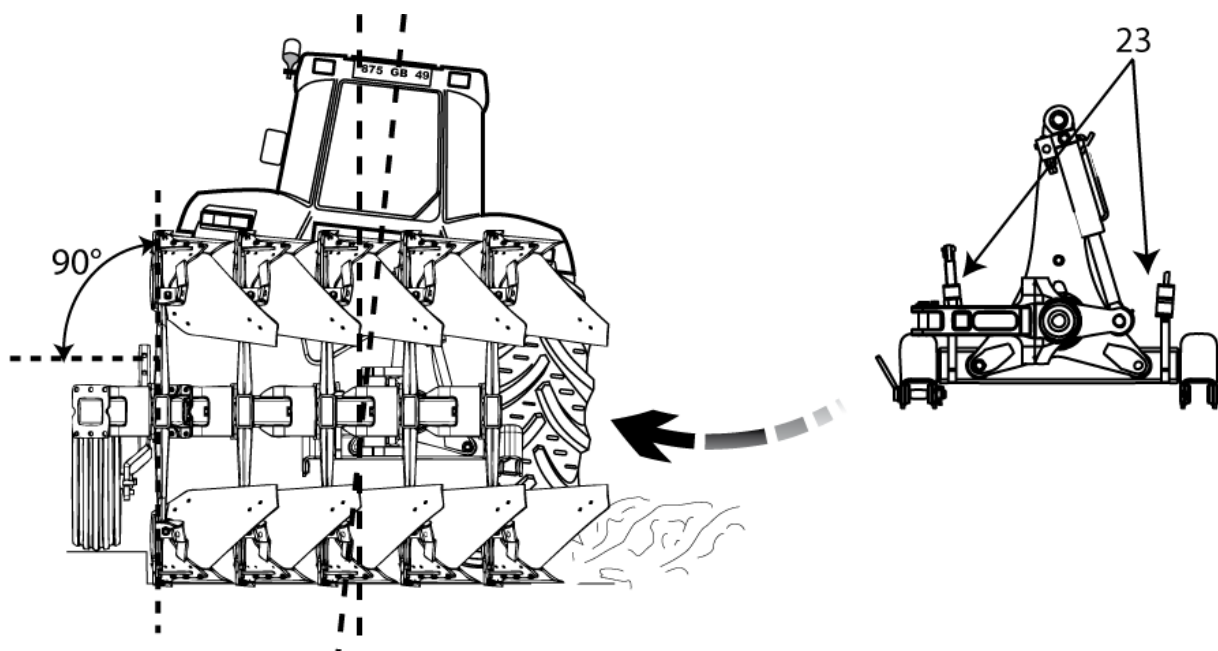
Forepart second course the adjustment of inclination guarantee, that hold the plough perpendicular to soil. To reach to adjuster, separate the chassis from adjusting screw by turning the plough. Correct the adjustment by the screw (23) to obtain the desirable inclination. Do not forget the handle of adjuster screw (24) connect to fixing pin (25) before continue the operation.



ATTENTION: Never put your hand between the chassis and adjusting screw. Risque of fracture, amputation and death.

In normal case generally the boom perpendicular (90°) to soil.

In case the plough work on slope, or the soil clayey, it is possible to incline the plough to working side to increase a little bit the pressure at end of mouldboards.



Operation manual of plough RW 47

IMPORTANT: The changing the inclination modify the working depth.

9.6.3. HYDRAULIC OR MECHANICAL. ADJUSTMENT OF 1th FURROW WIDTH (Deport)

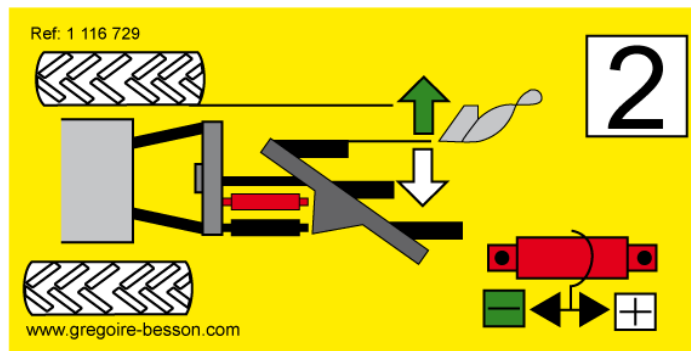
Before begin the second course, do not forget to close the adjustment of first furrow. If the position of reference is not known adjust the cylinder to middle position.

To find the suitable first furrow width is enough to see the result of previous ploughing (if the lateral and longitudinal level adjustment of the plough has been performed).

If the plough equipped with hydraulic deport cylinder, in this case you can adjust it front or rear in time of operation, too.

- **a / If the first plough bottom leaves hillocks** it is because of too big furrow edge. The furrow edge quantity is bigger than it is needed for compactness. If the first furrow width is decreased hydraulically (deport) the first plough bottom will tear out less ground and hillocks will disappear.
- **b /If the first plough bottom leaves dishes** it is because it does not tear out enough quantity of the ground for finishing the furrow. With hydraulic increasing of the first furrow width (deport) the first plough bottom more ground will tear out and dishes will disappear. These adjustments can be performed during the plough work. So at once you can see the result of the first furrow adjustment.
- **c / Individual case:** If the deport of the first plough bottom is too big then instead of hillocks there will be dishes. And the width of the rearing is too big for plough capacity. It can be explained that the mouldboard is not long enough to throw more ground to furrow. So the furrow has not been properly backfilled. With decreasing of the first plough bottom tearing width the end of the mouldboard will be able to throw the ground into the furrow and hillocks will disappear.

Under the bras of deport is a notice, which explain the method of adjustment:



If the first plough bottom leaves hillocks, because it take up too much soil, to eliminate the fault **increase the lenght of deport arm** while the first sock will be separate from previously.

If the first plough bottom leaves dishes, because it take up not enough soil or the déporté work is excessive. to eliminate the fault **decrease the lenght of deport arm**.

NOTE :

- On the slopes or uneven soil surface the first furrow width must be corrected to smooth ploughing.

Operation manual of plough RW 47

- Too worn plough blades, coulters can not provide smooth ploughing.

9.7. ADJUSTMENT OF «B» SCREW SECURITIES



In case of sock come up the safety screw shearing:
Never stand in shearing area and keep safety distance when the plough operate.

The disengagment of secureing causing the shearing of two 16 mm diameter, 50 mm long pins in same time.

The disengaging load of pins at top of stock influence the temper of pins and the height of plough.

PLOUGH	SCREWS VI3106+VJ324 Temper 8.8	SCREWS VI3107+VJ324 Temper 10.9
Height 1m60	4800kg	6000kg
Height 1m70	4500kg	5700kg
Height 1m80	4200kg	5300kg

To make the change of pins easier we advised to take the plough to transport position. In this case the parts are in horizontal position. It render, that the holes are in same level and the pins are changeable without force.

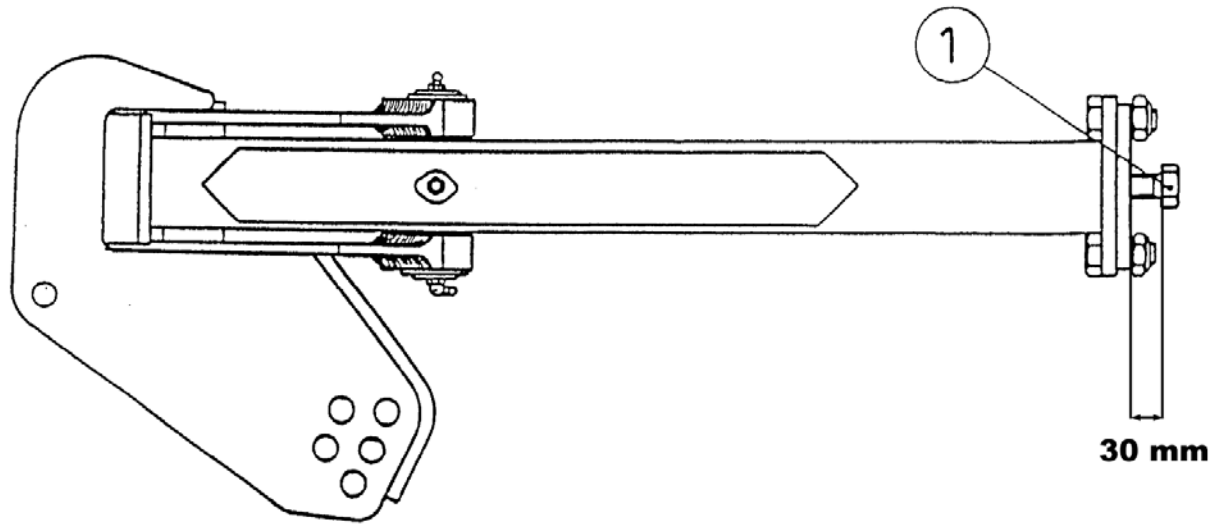
9.8. ADJUSTMENT OF «S» MECHANICAL SECURITIES (Option)

The disengagement load is adjusted by manufacturer for average safety use. The load of pins adjustable by screw (1).

For increase the load turn the screw (1) by 1 or 2 turning.

Grease the articulation points regularly (5 grease points).

The force on the top of beam is between 1500 and 3000 kg.
Adjustment in factory: 30 mm to head of screw M20 (see on next figure)



9.9. ADJUSTMENT OF «N» NON-STOP MECHANICAL SECURITIES NAUD (Option)

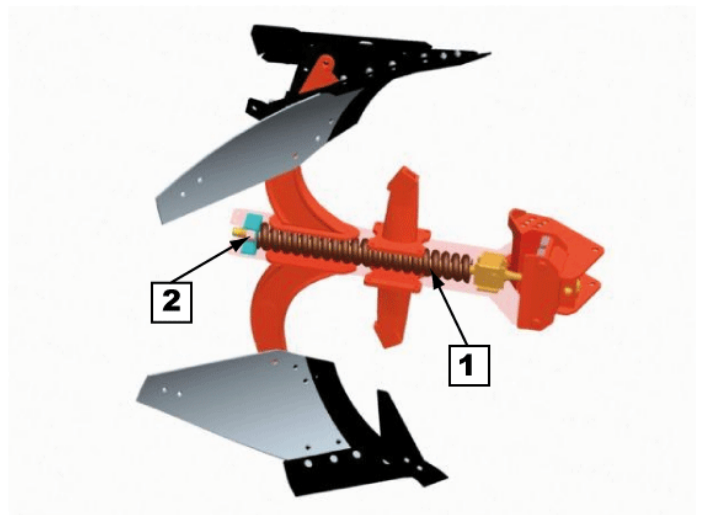
The disengagement load is adjusted by manufacturer and the value:

Disengagement load: about 750 kg on the skimmer top.

But it is adjustable by screw (2), which tightens plus or minus the spring (1).

In case the socks must come out from the soil frequently (stony soil), reduce the load on skimmer top by decrease the tightening of spring (1). By realising of screw (2).

In case the socks come out from soil too often and too easy, increase the load on skimmer top by increase the tightening of spring. By tightening of screw (2).



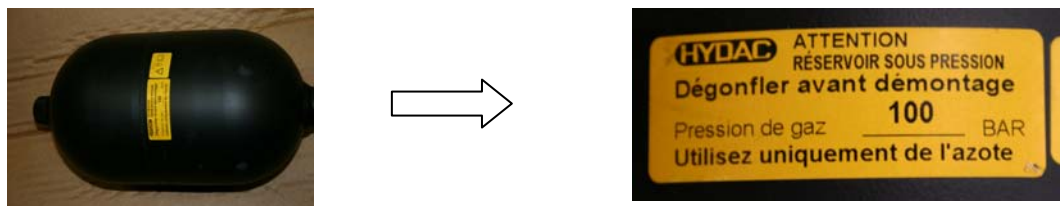
9.10. ADJUSTMENT OF HYDRAULIC NON-STOP SECURITIES

The elements of Grégoire-Besson Varilibre plough can be optionally equipped with Y type hydraulic Non Stop security.

Behind every element there are two pieces of 3.5 liter capacity hydraulic accumulator. On the front and rear beam there is 1-1 accumulator. Two accumulators have the same hydraulic circuit.

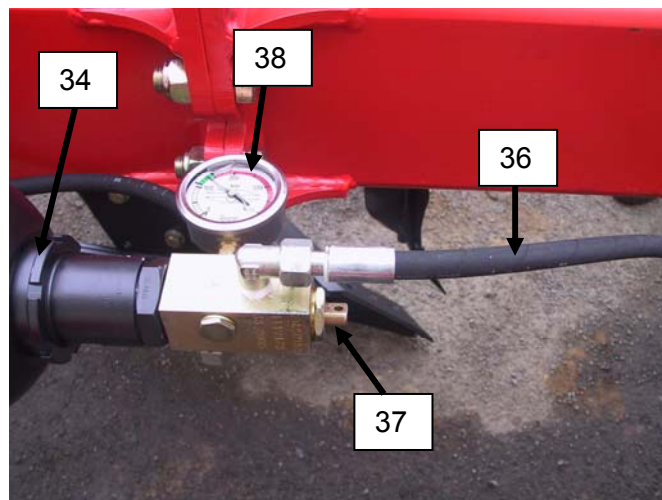
Inside the accumulator there is a flexible membrane which devices the hydraulic circuit from nitrogen under the pressure.

Nitrogen compress pressure in accumulator is given, it is displayed and can be modified.



Az akkumulátoron található jelölések

9.10.1. Securities base setting



- The front accumulator (34) is connected with security cylinder (one on every plough bottom).
- Hydraulic provision of the security circuit provides the flexible pipe (36).
- During the operation (plough) the pin (37) is closed and dosing is stopped, so the hydraulic circuit of the securities becomes totally separated from the tractor.

The index of the manometer (38) shows the industrial hydraulic pressure of the securities. There is mode to modify the pressure if we want to increase or decrease the disengaging torque on the plough blade end.

9.10.2. The increasing of the disengaging torque of the plough blade end.

If we would like to increase the measured disengaging torque at the end of the plough blade (heavy soil) in the inner hydraulic circuit of the securities the pressure should be increased.

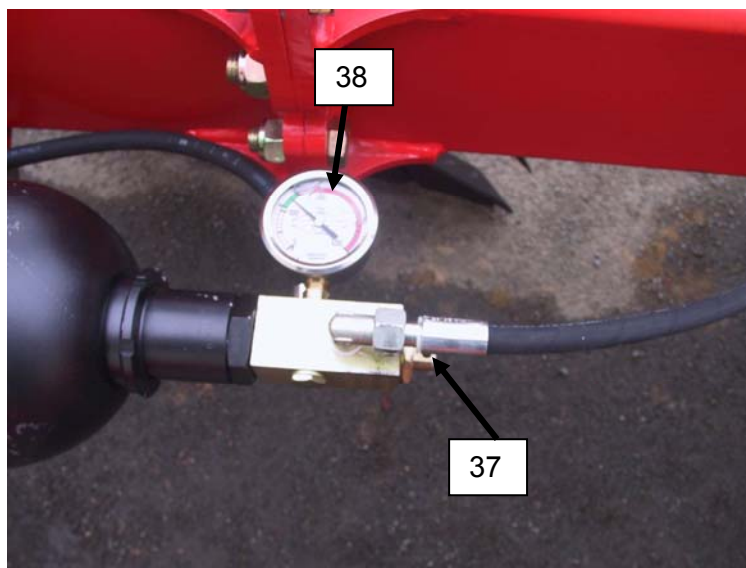
The pressure can be increased by adding more oil into the system. Oil surplus will be pressed by nitrogen which is on the other side of the membrane. So greater force is needed at the end of the plough blade for security elements to operate.

9.10.3. The decreasing of the disengaging torque of the plough blade end.

If we would like to decrease the measured disengaging torque at the end of the plough blade (light soil) in the inner hydraulic circuit of the securities the pressure should be decreased.

The pressure can be increased by reducing oil in the hydraulic circuit. As the hydraulic pressure will be later, the nitrogen which is on the other side of the membrane will expand. So less force is needed for the operating of the security elements.

9.10.4. The operation for modification of the disengaging torque of the hydraulic Non-Stop security.



1. Put the pull device on the ground before beginning the securities base setting.
2. Turn the plough on the right side vertically without putting the plough bottom on the ground.
3. Leave about 15 cm (6") between the end of the plough and the ground.
4. In the cabin put into the neutral position controlling lever of the lifting device.
5. With the help of flat screw-key 2 turning open the doing cock (37).
6. As the security hydraulic circuits are in the opened position, it will be easier to add or take the oil if the directing lever of the rear beam lifting devices is pulled back in the driver cabin.
7. After the movement of the manometer indicator (38) close the cock back (37) when the required pressure was reached.
8. Perform test ploughing to see if the disengagement is suitable.

If the parts hammer and all the time disengage then the pressure of the security circuit should be increased.

If the maximum set in the green line of the manometer is not enough, connect the brand dealer. He can recommend more optional solutions to use the plough in the given conditions.

- The increasing of the security cylinder Ø on every element (100, 110 or 125 mm);
- The equipment of 150 bar pressure accumulator (nitrogen pressure).

If the plough bottom too often catch stones or there are too many stones then the industrial pressure of the securities should be decreased.

If the pressure is too high it may obstacle the disengagement of the plough bottom during the impact. It is dangerous because of the breaking (wearing pieces, bolts, screws, holder) the

Operation manual of plough RW 47

life of the plough will be reduced because of the beam unnecessary force action.

If you have problems connect with the GRÉGOIRE-BESSON dealer who can recommend you suitable solutions.

IMPORTANT: If the pressure is too low then two upper supporting ball pins turns out of the case and plough bottoms slowly go down to the ground. It is enough if the pressure will be increased again to put the elements into the normal position.



ATTENTION: Too low pressure can result the plough bottoms putting down. It is dangerous as we may be injured or suffer such crush injury which may lead to amputation or even death.

9.10.5. ADJUSTMENT WHEN YOU ARE ALONE IN THE FIELD

When only the tractor operator is working it may be too long to hit the security hydraulic circuit pressure. You should go forward and back in the driver cabin between the controlling lever and circuit breaker (37). At that time the following simple mode should be applied:

- A. Look at the pressure on the manometer compared with the actual one, required pressure value (+ bigger – smaller).
- B. Open the cock (37),
- C. Go into the driver cabin and alter the rear beam lifting lever to let more oil to enter the circuit. Be sure that the manometer shows higher value of the pressure.
- D. Close the cock, in hydraulic circuit there is still more oil. (37).
- E. Go back to the driver cabin and put hydraulic directing levers into „self-adjustable” position,
- F. Carefully open the cock (37) for the oil overflow go back into the tractor.
- G. Quickly close the cock (37) the indicator of the manometer (38) during the pressure reduction reaches the new required value.

ATTENTION : Do not increase the accumulator pressure above the possible used values.

The too big pressure in the hydraulic circuit prevents the operation of the securities. The gas (nitrogen) would be totally pressed because of the hydraulic pressure. As the accumulator is full with oil it would not be the buffer and could not absorb the oil coming from the securities..

<i>The nitrogen compress pressure in the accumulator</i>	<i>Oil pressure set values seen on the manometer</i>
70 bar	80 - 120 bar
100 bar	110 - 150 bar
150 bar	160 - 200 bar



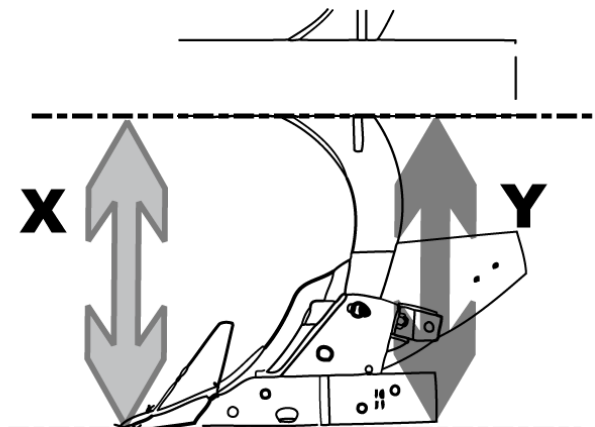
ATTENTION: The hydraulic Non Stop security works as element: The upper plough part and the bottom plough part turn up at the same time. Nobody must stay in the zone of security disengagement.

Do every precaution described in the chapter 2 especially about the pressure in the hydraulic circuits.

9.11. ADJUSTMENT OF THE PENETRATION ANGEL OF THE PLOUGH BOTTOM (Entering)

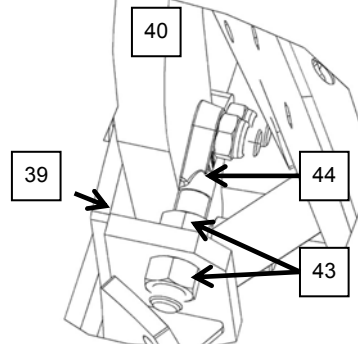
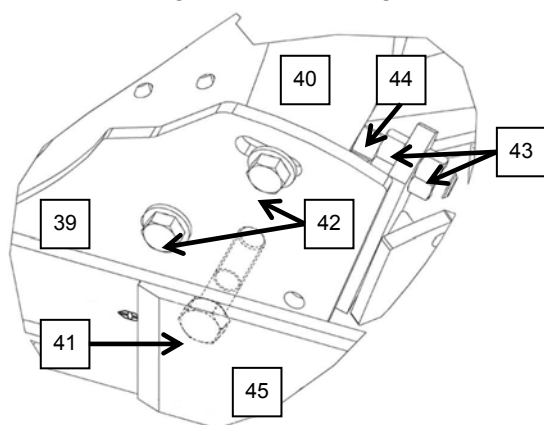
$$Y = X - 15\text{mm}$$

~~$X \leq Y$~~



The penetration angel is industrially set to produce the 15 mm difference between the front part of the plough-sole the rear part which fixes the plough-sole.

Under the normal condition it is not needed but there is possibility to adjust the penetration angel of the plough bottom (drought, extremely hard, or under special conditions).



For the greater penetrating of the plough, the plough cane (39) relating to the connecting rod should be turned forward (40).

The turning is performed around the bottom fixing bolt (41) it is mounted into the hole of two upper bolts (42). The angel regulation is provided by adjusting lever (44) with fastening of two female screws (43).

The method to be followed (Operational mode):

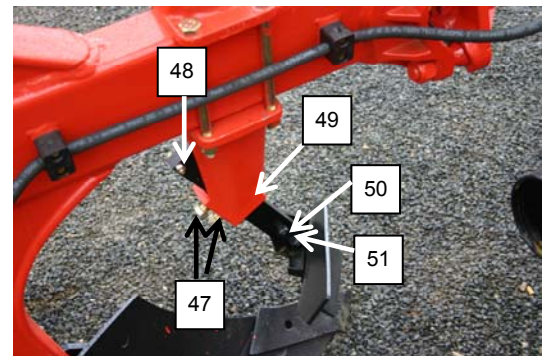
1. Turn the plough vertically on the needed side without putting the plough bottoms on the ground.
2. Clear away the ground and clean the points of admittance to the bolts and control levers.
3. Dismount fastener of the plough sole (45) to be able to reach the bolt (41),
4. Loosen the fastening bolts and transporting bolts (41 and 42) in order two bolts (42) were able to go into the long opening.
5. Loosen the front female screw of the pick control lever (43).
6. In order the plough bottom could penetrate better the rear female screw of the pick control lever (43) should be fastened.
7. To abate the plough bottom penetration the front female screw of the p pick control lever (43) should be loosened.
8. If all adjustment has been finished, all bolts and screws must be fastened and the fastener of the plough sole (45) must be mounted back..

Operation manual of plough RW 47

IMPORTANT:

- If we are not going to return to the field before changing the plough bottom angel adjustment, check the wearing parts condition (gib heads and blades). The worn parts prevent the required penetration. The gib heads should be pulled forward and blades should be changed.
- If plough bottoms penetrate too deep, it is difficult to pull the plough, the fuel consumption is being increased, the securities will be disengaged, the ground will slip under the rear part of the breast.
- The rear measured height (Y) must never be less than the front measured height. (X).

9.12. ADJUSTMENT OF JOINTERS



The task of the jointers is to cut plants to provide suitable rotation of the residues.

The height of the jointer can be adjusted (from top to bottom) and from front to back direction.

Operation manual of plough RW 47

9.12.1. Security pins on the jointers

The jointer is protected by shearing. At hitting the obstacle (stone) the upper pin (50) shears and the sole of the jointer turns round the pin.(51) As standard equipment the shearing was calibrated to 80 kg (GB reference: VI 29 08).

We increase the security resistance, if the 100 kg calibrated pin (GB reference: VI 29 09) is used. The suitable pins can be got from the GRÉGOIRE-BESSON dealer.

9.12.2. Adjustment of the jointer height

Generally it can be said that the front part of the jointer iron (46) should be adjusted so that it could work in the half height of the soil (about 6 cm / 2"1/2).

- In order to adjust the working depth of the jointer, two cusped screws (47) should be loosened so as to be able to pull them out of the hole of the jointer arm (48)
- Push the jointer arm (48) into the holder (49) till you get the required height.
- Screw back two cusped screws (47) paying attention that the jointer arms (48) go back into the hole.
- In order to put other jointers into the same level, perform the operation accordingly to the number of the holes on the rear part of the jointer.
- The length of the standard jointers is (48) 330 mm ($\approx$ 13"). There are longer models (410 mm / 16") to use them for less deeper ploughing (Reference: 19 186).

NOTE:

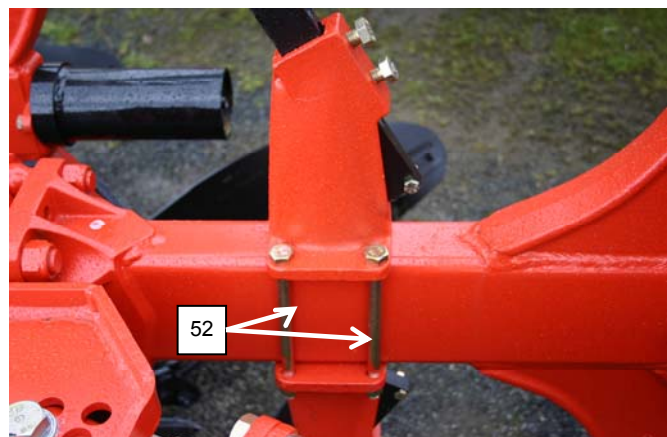
- Changing the depth of the plough, the jointers adjusting should be corrected as well.
- If the jointer is adjusted too high, behind the jointer (and at the rear part of the plough bottom around connecting link) there may be clogging as the plants will not be cut properly.
- If the jointer is adjusted too deep, there may be clogging in front part of the jointer which will not be able to absorb too big quantity of the plant residues. At the same time the plough can be pulled with bigger difficulty and the tractor will use more fuel.
- In both cases it is possible that the plant residues will not be rotated properly.
 - ☒ Think over this situation till the end before performing the adjusting the jointer.
- The modification of the adjustment start on one or two jointers, then test them. If the result is suitable, adjust the other jointers. In the contrasting situation perform another adjustment.

9.12.3. Adjustment of the front/rear part of the jointer

Generally it can be said that the jointer are adjusted in such a way that the end of the jointer iron can be turned vertically to the end of the plough head.

If we push the jointer forward, the plant residues will be rotated onto the bottom of the furrow.

If we push the jointer backward, the plant residues will be rotated onto the head of the furrow.



In the case of big quantity of the plant residues the jointer should be pulled back.

In order to push the jointer forward or pull it back four bolts (52) must be loosened.

10. AJOUT D'UN CORPS SUPPLEMENTAIRE.

10.1. SAFETY DEVICES



This operation requires such protective equipment for supporting plough and plough fastening, for lifting the supplementary plough bottoms as helmet, protective goggles and gloves as well as safety shoes in good conditions.

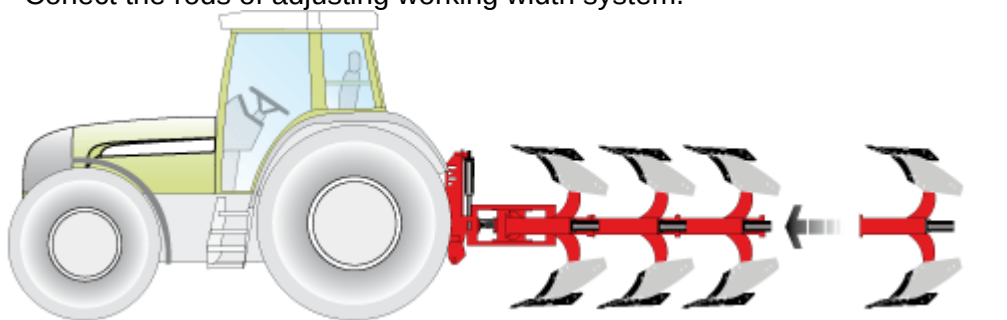


Never let it be improvised if you deal with this protecting equipment, connect with your GRÉGOIRE-BESSON dealer.

The plough must be attached to the tractor normally.

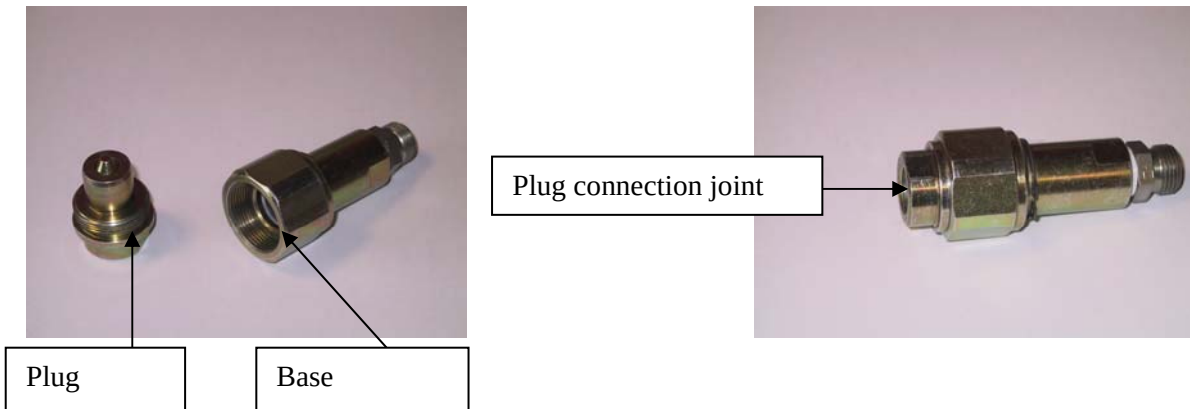
10.2. ASSEMBLE THE SUPPLEMENTARY PLOUGH BOTTOM FOR LPOUGH RW 47.

1. Before starting the operation put the towing device to smooth ground.
2. Turn the plough side to horizontal position, stocks don't touch the ground, keep 15 cm distance between ground and stocks.
3. Stop the motor and apply the parking brake, get out the starting key and put it to own pocket.
4. With lifting device put the plough bottom to beam, mount all 12 screws and fastening them. Dismount from lifting device the plough bottom.
5. Connect the rods of adjusting working width system.



6. Connect the safety hydraulic system: (option)
 - Release the pressure from hydraulic circuit.
 - Remove the lock cup from the hydraulic system of last plough bottom.
 - Connect the hydraulic couplers.
 - Restore the hydraulic pressure to system.

IMPORTANT : The security hydraulic connections should be screwed to the end to have the securities of the supplementary plough bottoms work properly. The ploughs union nut must impact the suitable part of the connection base.



For a more safety decrease the pressure in the safety hydraulic system.

7. Reassemble the rear table and the signalisation unit to supplementare plough bottom.

10.3. HOW TO CONTROL THE SUITABLE WORK AND FITTING OF THE HYDRULIC SECURITY ON THE ADDITIONAL PLOUGH BOTTOM

1. Fasten the plough into the transporting position and the plough bottom into the vertical position.
2. Eliminate the pressure in the hydraulic circuit as it follows:



- Open the valve at the end of the accumulator.
- The circuit pressure which is in the connection with the accumulator eliminate by putting the distribution lever into self-adjusting position and follow the instructions about tractor usage.

Attention, by eliminating the pressure in the security cylinders, the plough bottoms cannot be kept up and there is the risk that they may fall down. The plough must be fastened.



3. The manometer of the accumulator must show zero.
4. Every plough bottom must go down one by one.
5. If the hydraulic connection has been performed properly, the supplementary plough bottoms should go down as well. If it does not happen we should check the fastening as it described above.
6. For accumulator blowing up and the circuit placing under the pressure the tractor distribution levers should be put into the operation till the manometer indicates in the green line the required pressure.
7. The lifted plough bottom keep the new hydraulic pression value. Close the latch of accumulator.

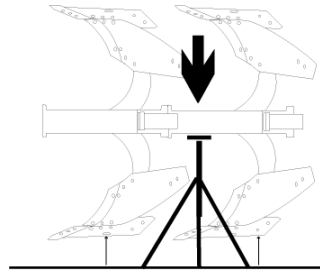
11. GREASING AND MAINTENANCE

The user and the owner of the machine is responsible for its maintenance.

It is essential to understand the maintenance procedure very well before performing any interference or adjustment on the plough.

Turn for help to the GREGOIRE-BESSON dealer if you have difficulties.

11.1. PREPARATION AND ORGANIZATION OF THE MAINTENANCE



- The area where the plough is maintained must be plane, clean and must not slip.
 - Pull the hand brake, the gear must be in the «Parking» position and the plough must be put on the ground.
 - Stop the engine, then eliminate the hydraulic pressure in the circuits (SE – DE) with the help of the control levers in the driver cabin.
 - Take out the starting key and put it into your pocket.
- Wait till the engine and the spare parts become cool and dry.
 - NEVER try to interfere while the machine is in motion.

11.2. SAFETY INSTRUCTIONS FOR PLOUGH MAINTENANCE

Follow the rules described in the 2. chapter of the instruction

- Recognize and understand the information signs,
- Follow the security instructions,
- Be prepared for critic situations,
- Do not wear large clothes,
- Wear suitable protective equipment,
- Avoid dangerous situation in connection with overrunning,
- Take out the starting key,
- Pay attention to the electric wires,
- Do not perform adjustment of the moving plough,
- Be careful with cutting and getting nipped,
- Be careful at swinging,
- Pay attention to the elements under the pressure (security etc.),
- There must not be any passengers in the tractor,
- Be careful of gas and fluid under the pressure

Take care of continuous airing of the place if you want to start the tractor. (The engine exhaust contains toxic CO).

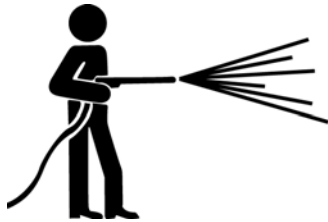
11.2.1. APPLY SAFETY PRACTISE

Show responsible and competent attitude:

- At once change all the damaged spare parts,
- Change the worn and broken spare parts,
- Keep the spare part sin good condition and properly mounted,
- Put on the place chain-cases and equipment. If it is needed change them,
- Gathered grease, oil or other pollution must be eliminated and the spare part must be cleaned,
- After finishing the maintenance be sure that there are no any spare parts or tools on the way of the wheels,
- If several persons work on the plough, make sure that every task has been fulfilled (for example, all screws has been put back).

IMPORTANT: If on the original plough we perform any modification, the manufacturer do not take any responsibility and refuse the guarantee.

11.2.2. TAKE THE INSPECTION EASIER WITH WASH OF MACHINE



- Before any maintenance find time to hose down the machine and clean it from the dirt. It is easier to do the inspection and adjustment as well as it is easier to keep clean the area of maintenance.

BE CAREFUL with the stream under big pressure:



- The power of the stream under big pressure may cause injury on the body or in the eyes. Use the hose accordingly.
- Be careful, do not damage or pull down the security matrixes on the plough. Put the new ones instead of damaged or missed.
- If you use washing equipment with big pressure, do not keep it too close to the machine and do not direct the stream to the electric equipment, connections, hydraulic pipes, contactors etc.
- After the cleaning check the hydraulic flexible pipes and be sure that they do not leak, that the connections are not loosen or damaged.
- If you notice any damage, repair it at once.
- After washing grease the machine, by this you can clear way the water from axle of the articulated connections and rings.

11.2.3. WORK IN GOOD VENTILATED PLACE



- In the workshop where the maintenance is performed the place should be properly ventilated.
- Never leave the tractor engine go in the closed building. The exhaust can cause asphyxia or cancer.

11.2.4. WORK IN THE CLEAN PLACE



- Think over the necessary place to have proper maintenance.
- Take care that the place is always kept clean, in order and dry.
- Put away and store the dismantled spare parts. For small spare parts use storage boxes.

11.2.5. USE SAFETY SUPPORTS

Generally before the maintenance or repairing the plough must be put down.

If it should be kept up:



- Put the tractor in the «Parking» position and put the tractor hand brakes. Support the plough wheels.
- Do not neglect tractor or plough hydraulic cylinders. If any element of hydraulics breaks away or leaks it may cause serious injury or death.
- Every element of the machine must be supported if you are going to work under it.



loading etc.).

- Do not support the machine with wood, concrete or stop pieces, they can break, slip, roll off.
- Do not use screwing hydraulic elevator (crick).
- Use supporters in accordance with the security norms (size, loading etc.).



ATTENTION: Be careful while you are working under the machine. If you want to maneuver with the plough, be sure there is nobody under the machine.

11.2.6. DISCHARGING OF THE ACCUMULATOR



Before welding or any other interference in the electric circuit, pull the negative cable out of the accumulator.(-).

11.2.7. PAY ATTENTION TO THE LIGHTS OF THE WORKING AREA



It is important to work on the illuminated place. It is even more important that our light equipment meets requirements of the security norms. If you use hand lamp (mobile work lamp), be sure that it is in good condition and is protected by metal basket.

A broken lamp may be enough to flare up oil or fuel on the ground.

11.2.8. USE PROPER TOOLS



The plough screws are metric. Use only metric implement. Other implement can slip and cause danger of injury. The adapted implements must be used.

11.2.9. THE SCREWS MUST BE FIXED ACCORDINGLY

It is important that every screwing (bolt or screw + female nut) should be used on the place defined by GREGOIRE-BESSON. It is important to fasten every bolt or screw depending on its diameter and brand.

The fastening of the bolts and screws should be in good condition.

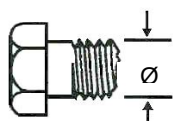
- Too strong screwing more often causes breaking of the screws. If the screw is fastened too strong then we have overcome the apparent elastic limit. It will be elongated, even broken. This time the fastening claims can not be met.
- Because of a loosen screw the spare parts can be broken or missed.
- During changing be sure that new screws have the same technical parameters.
- Properly clean the screw-threads and be sure of the first screw-thread grip capacity.
- During assembling (accordingly adjusted) hand wrench or hexagon key can be used. But it is not advisable to use box junction or other tools for increasing of the fastening capacity. It is not only dangerous but the screw can be broken.

11.2.10. NORMS OF SCREW FASTENING

The torque of the fastening depends on the screw diameter and its brand. The following table will help to find the optimal effectiveness of the fastening.



The mark of the screws can be changed by a manufacturer



Dimensions			Category 4.8			Category 8.8			Category 10.9			Category 12.9		
			(40 kg)			(80 kg)			(100 kg)			(120 kg)		
Ø (mm) Screw	Tool size (mm)		N x m	kg x m	lb - ft	N x m	kg x m	lb - ft	N x m	kg x m	lb - ft	N x m	kg x m	lb - ft
	Norme DIN	Norme EN												
M 8	13		14.5	1	11	28	3	21	40	4	30	47	5	35
M 10	17	16	29	3	21	55	6	41	80	8	59	95	10	70
M 12	19	18	50	5	37	95	10	70	140	14	103	165	17	122
M 14	22	21	80	8	59	150	15	111	220	22	162	260	27	192
M 16	24		125	13	92	240	24	177	350	36	258	400	41	295
M 18	27	26	170	17	125	330	34	244	475	48	351	560	57	413
M 20	30		245	25	181	475	48	351	675	69	498	790	81	583
M 22	32	34	330	34	244	650	66	480	920	94	679	1080	110	797
M 24	36		425	43	314	820	84	605	1150	117	849	1350	138	996
M 27	41		625	64	461	1200	122	886	1700	173	1255	2000	204	1476
M 30	46		850	87	627	1630	166	1203	2300	234	1697	2700	275	1993
M 36	55		1450	148	1070	2850	291	2103	4050	413	2989	4750	484	3506

Rigid fastening torque on electroplated/anchored screws (general usage). 1 N x m = 0.1019 kg x m 1 kg x m = 9.81 N x m 1 N x m = 0.738 lb x ft 1 lb x ft = 1.355 N x m Only for information: the length of screws is measured under their head

11.2.11. BE ATTENTIVE WITH ABRASIVE GRIT PIECES



Be very careful when you change such abrasive spare parts as parts of the plough bottoms or disc coulters. Because of the chafing to the soil they can become razor edged.

- The plough sole be so acute that if they go under the skin or penetrate into the eye they can cause very serious injuries.
- The disc coulter can cause deep wound.

The screw heads on the abrasive part of the plough can cause cuttings. NEVER hold the screw with your bare hand, especially if you loosen them with the hexagon key. They may slip and cause serious cuttings. Use clamps or a piece of wood.

To avoid the danger of accident:



- Wear thick leather protective gloves.
- Wear protective glasses (goggles) every time when you use a welding torch or grinders, cutting off machines to cut some spare part or screw.



11.2.12. PAY ATTENTION TO GAS AND FLUID UNDER PRESSURE



The fluid under the pressure during discharging can cause injury getting on your skin or eyes.

Systematically check hydraulic connections and flexible pipes condition.

The hydraulic circuit breaking or leakage must be repaired at once.

To avoid any accident before the hydraulic pipes connecting or disconnecting, you should eliminate the

inside pressure.

That is why after the tractor was stopped and the plough put down on the ground, push the hydraulic distribution levers which are in the switchboard, from the front position back in order to release the oil under the pressure.

Before you put the hydraulic circuit under the pressure, check if component parts and connecting elements (joints, flexible pipes) are in good condition.



- Use a stick and wear thick leather gloves.
- Wear thick protective gloves and glasses (goggles)!
- NEVER search the leakage with you hand.
- For bigger safety use protective glasses.

If you are injured because of fluid leakage, at one go to see a doctor! If any fluid has got on your skin you should clean it as it may cause gangrene which leads to amputation or even death.

Every doctor who cannot cure any type of such injury should connect with the professional institution.

During the work the back window of the tractor cabin must be properly shut. The glass provides protection in the case of fluid leakage.

11.2.13. DO NOT PERFORM HEATING OR WELDING NEAR HYDRAULIC AND FLEXIBLE PIPES



Never heat, weld, saw, chisel or use autogenously cutting near hydraulic pipes or any other flammable elements, for example fuel, paint or petrol.

During performing welding disconnect tractor accumulator and protect pipes (mainly rubber pipes) in order not to be damaged which can lead to losing of oil or hydraulic fluid.

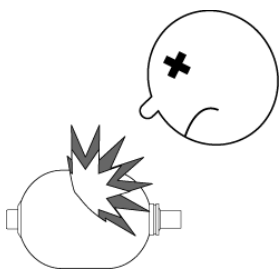
The heating near hydraulic pipes with high pressure can cause accidental punctuation.

The leaking oil may break into flames and cause serious injuries or even death.

11.2.14. DO NOT OPEN HYDRAULIC ACCUMULATORS!

The plough is equipped with such an accumulator which function as a dash-pot or hydraulic safety element.

These accumulators have been charged under pressure industrially with nitrogen.



- NEVER try to repair them in the case of operation disturbance!
- If you do not follow rules during the reparation it can lead to the leakage of gas or fluid and cause injury on your skin or in your eyes.
- Wear protective glasses and gloves when you are taking the accumulator off the machine.



Only the official GREGOIRE-BESSON dealer has right to have this equipment repaired in the professional workshop.

In some countries every ten years you can ask for the acceptance test of accumulators under the pressure.



A hydraulic accumulator is a device under the gas pressure. It is forbidden to change its external form with welding, chiseling, drilling or other kind of work.

The hydraulic accumulators and their fastening must be in good condition.

In the case with accumulator you should take all precautions and never exceed the allowed maximum pressure.

After checking or adjusting there must not be any leakage.

Before putting the pressure in hydraulic pipes back, be sure that every joint is accordingly fastened.

11.2.15. BEFORE HEATING ERCH AWAY THE PAINT!

Smoke is toxical. During the paint heating, welding, chiseling or autogenously cutting it can go into the air.



- Such kind of work perform in well aired place.
- Etch off the paint before heating or welding .
- If the painted surface must be sand-blasted or chiseled you should avoid the dust inhalation.
- Use special breathing mask.
- If you use chemical etch material, wear protective gloves and industrial protective goggles. Then clean them with soap before welding or doing the heating.
- Clear away the containers and other flammable materials and store them in proper place.
- Wait at least 15 minutes till vapor has been blown away before welding or heating.
- Do not throw to other waste paint, dissolvent or their packaging.
- Always keep the fire-extinguisher near by. Systematically check it in accordance with the usage parameters.
- For doing the quality work, clean the spare parts before painting them, then before putting the last painting use the ground-color. For better usage the GRÉGOIRE-BESSON ground-color and paint are aerosol.

ATTENTION : Paint and etch vapour can cause cancer.

11.2.16. PRECAUTIONS DURING TYRES MAINTENANCE.

The plough and tractor tyres must be regularly checked, the pressure must be on the proper level. Get informed about them in the instruction and compare them with the indication written of the tyre side. If you do not understand something ask from our dealer or tyre manufacturer.

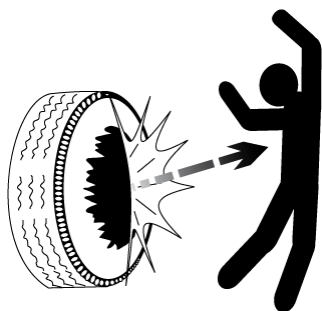


- Do not blow up the tyres above the recommended pressure value.
- To perform smooth ploughing in both direction, the wheel-load of the tractor and on the both sides of the plough should be the same.
- During blowing up, try to stay as far as you can from the wheel, use a flexible pipe and a fang head.
- Every day check the tyres and wheels.
- Never drive with overblown or under blown tyres or if there are cuttings and bulges, if they are damaged or rusted, or if the wheel bolts or screws are missed.
- Wrong maintenance of the tyres can cause serious accidents as on the roads as on the fields.
- It is dangerous to have too high or too low pressure. The adherence of the tyre tread design will not be optimal. The same can be said about abrasion of the wheels.
 - If one of the tares must be changed, be sure that the tyre of the same parameters has been mounted (its profile, width, diameter, maximum speed etc.).
 - If you equip the new frame o non side of the bearing it may change the plough-adjustment as well as the machine moving on the roads.
 - The pressure in the wheels must be checked after every 50 working hours or once a week.

11.2.17. PRECAUTION DURING REPARATION OF THE TYRES

The reparation of the tyres is a dangerous operation.

Only the professional can perform reparation and equipment on the tyres.



- Do not try to put a tyre on the wheel-band if you do not have suitable experience or the adaptable tool.
- After the equipment back the wheel must be put into the security cage for blowing up.
- If you do not keep the necessary rules the tyre can come apart bursting which may cause serious injury even death.
- Call specialists who are experienced in agricultural tyre wheeling and have adaptable tools and equipment.



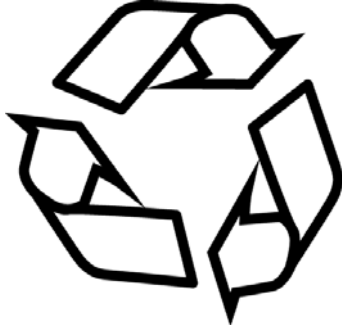
You can perform works on wheels if you have experience and suitable equipment. If the operation has not performed accordingly it can be dangerous. If you doubt call specialists who can help you.

Do not use tyres which parameters are different from instructions of manufacturer.

11.2.18. BE RESPONSIBLE FOR WASTE!

Wrong disposal of the waste risks the nature.

Throwing out paint-sprayers, hydraulic oil, paint-removers, hydraulic accumulators, fuel oil, coolant, brake-oil, filters, accumulator oil, or tyres used on tractors or ploughs damage and pollute the environment.



- For gathering the polluting fluid you must use well-closed containers. Do not use containers of drinks or food they may be deceiving.
 - Never let the impurities go on the ground or near water or drains.
 - Never try to punch or burn paint-sprayers.
 - Never burn old tyres, send them to recycling.
-
- According to the local law the waste must be put on the appointed place or be recycled.
 - Ask the waste-disposal service about gathering and recycling of the waste.

11.2.19. REMINDER



The best assurance against accidents is a **CAREFUL AND ATTENTIVE** operation.

The risk of danger increases if you are in a hurry or tired.

If you have any question about any part of this instruction or plough usage connect with GRÉGOIRE-BESSON manufacturer or with our official dealer.

11.3. FASTENING OF BOLTS

Before starting to use the plough be sure that every bolt and screw are fastened accordingly. After 50 working hours check every fastening and fixing, then before every season.

Every day pay special attention to:

- Bolt of wheels,
- Screwing of the wearing pieces during the usage on the gravel roads (big vibration),
- Plough bottoms, if they are mounted with plastic breasts.

11.4. LUBRICATION / GREASING

The adaptable greasing and lubricating of the moving parts provides the GREGOIRE-BESSON plough long life and performance. The lubricants can be found on every rotation point. The lubrication provides the suitable work of the articulated axles and vanishing of the dust out of axle-journals. Use the Unil – Opal MOS2 lubricant or the same quality lubricant. Clean the lubricators well before filling the lubricant into it. The impurities can close the pipes or passages. If the lubricator is plugged or worn, change it or clean it. During lubrication check the uninterrupted movement of the lubricant. If the lubricant overflow mixes with dust it can form the mass of abrasive effect. The over flown lubricant should be cleaned away.

The frequency of the lubrication is set for general usage of the machine you should pay additional attention if you work under hard or special soil conditions.

Study the Varilibre plough lubrication on the next page.

The lubrication contains:

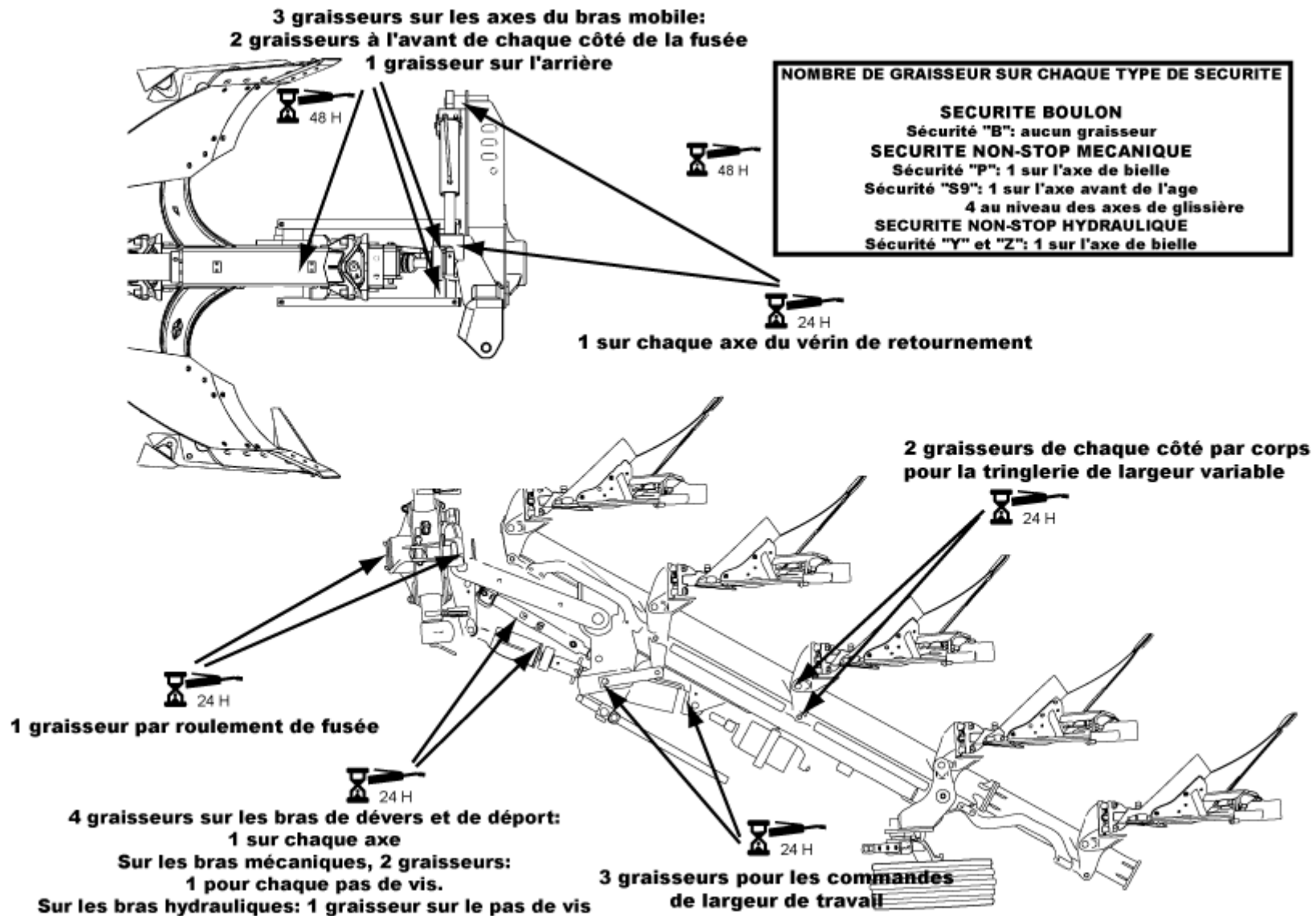
- The position of every lubricator on the plough.
- The number of handling lubricators.
- The 2 pictograms symbolize the frequency of the lubrication on every part of the plough:

- Lubrication after every 48 working hour.



- Lubrication after every 24 working hour.





11.5. THE MAINTENANCE OF PLOUGHS

Protect the surface of the breasts and blades against rust if the plough is not being used.



In the regions where the soil is extremely clingy, it is useful at the leaving of the plough-land to put flake oil coat on the breasts even in the case of some hours inaction. Use the sprayer of WD 40 oil type.

If the plough performance is stopped for longer period of time, the thicker oil coat can stay on the breasts for a longer time. There is such type of the oil which dries during some hours (Shell ENSIS – SX type), which is less polluting.

Dry graphite in the form of spray has got such property and during plough can quickly abrade.

Pay great attention when you pull forward the rod with holes. Screw out the bolts to release the rod. Then pull the rod forward with the help of a hammer or a piece of wood put between the rod and the hammer. In order to protect the machine operator from flying fragments.

THE REPLACEMENT OF THE USED PIECES:

The original GRÉGOIRE-BESSON spare parts are the results of the serious research work and assure good quality work and maximal life of the plough. By the equipping the plough with non-original GRÉGOIRE-BESSON spare parts the guarantee will be broken off.

The used part too late changing can reduce the quality of the work and damage the plough cane.

Reversible points :

Every point should be turned if the bottom of the point is abrading at about 10 mm (= 3/8") from the blade. If it has been already turned, put it forward or change it.

Blades / coulter:

Replace every blade if it abrades at 15 mm (= 1/2").

Plough end:

Every plough end should be changed if it does not protect the plough cane from the outside.

Turning plough sole:

Turn every plough sole, if the back part of it has abraded to 3 mm (= 1/8") thickness. Change it if it has already been turned.

Breasts:

Every breast should be changed before the front part of it becomes hollow. Or the rear part becomes very thin in order to resist the soil loading or in the case if it is too short to turn the soil properly.

11.6. THE PREPARATION OF THE PLOUGH FOR PLACING IN THE MACHINE-SHED

Before storage the plough at the end of the season

1. Clean the plough from dirt and plant residues as they keep the moisture and may cause rust.
2. If the plough is dry lubricate every axle-journal to clear it from water and other impurities.
3. If it is necessary correct the painting. The GRÉGOIRE-BESSON red paint can be got in the form of spray from the brand dealer.
4. Check if there are used or broken spare parts. If it is necessary change them.
5. Check if there are disengaged bolts. Fasten them or change them.
6. Check if there is too big lash of the axle-journal. If it is so then fasten them or change the wear-rings inside.
7. It is more reasonable to perform reparation immediately at the end of the plough season in order not to forget about them later. Do not delay the maintenance till the beginning of the plough season.

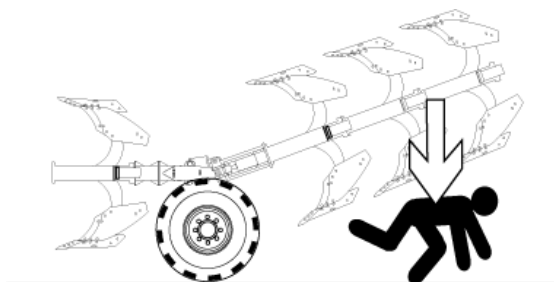
Protect the spare parts which are used for the work in the soil

Protect from corrosion the breasts of the plough and jointer and blades by putting on them the suitable thickness of the oil or graphite coat. A thin paint coat can be put as well but it is easily can be removed during the next ploughing.

Protect the rods of the cylinders which can not be pulled back.

The rust formed on the cylinders can damage their joining. If a push-rod can not be pulled back totally cover it with thin grease or oil coat (Shell ENSIS – SX type).

11.7. PRECAUTIONS DURING THE PLACING IN THE MACHINE-SHED



- up position,
- Neutralize the pressure in the hydraulic circuits with the moving the directing levers placed in the cabin from forward back after the tractor engine has been stopped.
- The plough should be placed far from any actions.
- The plough should be put in the dry, dust-proof place (if it is possible in the building), with pulled in cylinder rods in order to avoid rust,
- Some wheel can revolve free, so never lean against them, do not put anything on them that may fall.

- Before disengaging the plough, be sure that the storage surface is plane, clean and stable,
- Use blocking implements to prevent from the plough moving during or after the disengaging,
- Stabilize the plough wheels,
- NEVER leave the machine in the turning

ATTENTION: Do not allow children to play on or near the plough either during the storage or engagement to the tractor.



SINCE 1802

49230 Montigné Sur Moine - France
Tel : (+33) 2 41 64 72 67 - Fax : (+33) 2 41 64 67 73
Contactfr@gregoire-besson.fr

Grégoire-Besson UK LTD
Bourne Road, Carlby - STAMFORD Lincs - PE9 4NP - England
Phone : 01778 590223 - Fax : 01778 590645

Grégoire-Besson Canada Inc
4480, Rue Martineau - St Hyacinthe (P. Québec) - J2R 1V1 - CANADA
Tel : (450) 799 56 15 - Fax : (450) 799 56 29
bessonplows@hotmail.com

Grégoire-Besson Polska
Ruda 12 - PL - 64 610 ROGOŹNO - Polska
TEL/FAX : (067) 261 97 79
gbesson@poczta.onet.pl

Грегар-Бессон Восток
ул. Вокзальная, д. 2, 4-й этаж - 308000 г. Белгород
Тél.: +7 (4722) 27-21-31; Tél/fax: +7 (4722) 27-25-55
gregoirebesson@mail.ru>

Grégoire-Besson Beijing office (China)
CHANG XIN BUILDING - Room 220 - No.3 Yan Jing Li Middle St. - Chao Yang Men
Wai - Beijing 100025, China - Tel: 0086-10-65 08 06